

# Green Thumb Newsletter



Number 83-1

Denver Botanic Gardens, Inc.

Editor—Tommie Waidmann

January 1983

## Denver Chamber Orchestra to Perform In John C. Mitchell II Hall

The Denver Chamber Orchestra, James Setapen, Music Advisor, is pleased to announce an exciting new address—the Mitchell Hall at the Denver Botanic Gardens for three of the four remaining 1983 Winter/Spring concerts. This beautiful facility offers a setting worthy of one of Denver's premiere performing groups. Outstanding conductors, from Max Madrid, who founded the Denver Chamber Orchestra (then known as the Arapahoe Chamber Orchestra), Bruce Hangen, first Music Director of the DCO and Carl Topilow, now the Resident Conductor of the Cleveland Institute of Music, have brought the Orchestra to the forefront of Denver's cultural scene.

Now in its 14th season, the Denver Chamber Orchestra has demonstrated remarkable growth and success. Because of today's emphasis on all art forms, the Orchestra has brought to its center stage the varied talents of vocalists, choral groups, dancers and actors, as well as the excitement of international and local soloists. Since its beginning in 1969, the DCO has enabled its audiences to enjoy a wide spectrum of music from Bach to Bartok, Mozart to Webern. Although the DCO is perhaps one of Denver's best kept secrets for audiences at large, it has long been recognized in musical circles for superb musicianship, innovative programming and for introducing new and exciting talent to Denver music lovers. Such names as Jeffrey Kahane, a winner in the Van Cliburn Piano competition; JoAnn Falletta, conductor; and William McGlaughlin, conductor are just a few of the guests who now rank as rising stars in the musical world. And because of its smaller size (approximately 40 musicians), the chamber orchestra with its sense of intimacy offers a versatility, clarity and tonal perfection not readily matched by the larger orchestra's interpretation of a similar musical score.

The 1982-83 Season as a "Year of Search" for a new Music Director/Conductor has been a particularly exciting one for the DCO. Outstanding candidates from a nationwide field of 150 applicants have been chosen to conduct seven concerts of the '82-83 Season.

Artists Thomas Riebl, winner of the Hauberg Viola Competition; The Amphion String Quartet; Jeffrey Kahane, pianist; The Concert Choir of the Colorado Children's Chorale have prompted glowing comments from critics and audiences alike. Glenn Giffin of the Denver Post states, "What it (the DCO) does best is to explore repertory other ensembles are too unadventurous to play"; Blair Chotzinoff, "... the DCO has become a viable organization worthy of continued patronage"; Wes Blomster, "The DCO is unique and important—it is an ensemble of excellence devoted to all phases of the chamber repertory"; Glenn Giffin, "Fun, frivolous and fascinating."

Outstanding conductor William McGlaughlin, who was a favorite with DCO audiences in his appearance with the Orchestra in 1982, returns in April. He is now Music Director/Conductor of the Eugene Symphony and the Tucson Symphony. JoAnn Falletta, Music Director of the Jamaica New York Symphony Orchestra will be the first woman conductor for the DCO. James Setapen, Music Advisor for the DCO for the 1982-83 Season and Associate Conductor of the Denver Symphony will conduct the final concerts of the season. Barry Snyder, faculty member at the Eastman School of Music and member of the highly acclaimed Eastman Trio and Allan Vogel, principal oboist of the Los Angeles Chamber Orchestra will be two artists of national acclaim to highlight the DCO mini-series.

A continuing part of the "Chamber" tradition will be the reception after each Sunday evening concert at which time the audience has an opportunity to meet the conductor, guest artist and the members of

the Orchestra.

A special mini-series ticket for the remaining four concerts is now available at \$25.00 for adults and \$20 for students under 21 and senior citizens. Tickets for individual concerts are \$7.50 and \$6.00. They may be purchased at Music for All, 2908 East 3rd Ave., or by calling the box office at 333-8882.

Plan to join us at the Denver Botanic Gardens for memorable musical evenings!!!!

### Denver Chamber Orchestra Program

Sunday, Feb. 6 7:30 P.M. Dennis Herron, Conducting  
Monday, Feb. 7 7:30 P.M. Singers sponsored by Opera Colorado  
Haydn: Overture to "Lo Speciale"  
Mozart: Excerpts from "The Magic Flute"  
Bartok: Rumanian Folk Dances  
Schubert: Symphony #5 in B Flat Major

Sunday, March 13 JoAnn Falletta, Conducting  
Monday, March 14 7:30 P.M. Barry Snyder, piano  
Rossini: Overture to "Italian Girl in Algiers"  
Mozart: Piano Concerto #9 in E Flat Major, K. 271  
Ravel: Pavane Pour Une Infante Defunte  
Stravinsky: Pulcinella Suite

Sunday, April 3 William McGlaughlin, Conducting  
Monday, April 4 7:30 P.M. Joanne Goble, Bassoon  
Handel: Concerto Grosso in F Major, opus 3, #4  
Bolcolm: Commedia  
Sibelius: Pelleas and Melisande Suite  
Vivaldi: Bassoon Concerto in E Minor, F. VIII #6  
Ginastera: Variaciones Concertantes

Sunday, May 1 James Setapen, Conducting  
Monday, May 2 7:30 P.M. Allan Vogel, Oboe  
Stravinsky: Suites 1 and 2 for Small Orchestra  
Copland: Quiet City  
Mozart: Oboe Concerto, K. 314  
Beethoven: Symphony #4 in B Flat Major, opus 60  
This concert will be held at the Shwayder Theater, Jewish Community Center.

## Winter Education Events Announced

In a departure from past practices, the classes, workshops, exhibits, etc., which comprise our January education schedule will be found on Page 6 of this newsletter. While a more complete listing of first-quarter '83 events will be forthcoming, it will not be mailed to members until early to mid-January, along with the annual calendar of events. This is an inevitable consequence of several factors. One, the position of Horticultural Education Coordinator which was vacated in September, remains unfilled. It appears that candidates recruited by the Career Service Authority will finally be invited to take an oral exam and be interviewed during mid-January with the position being permanently filled sometime in February. Secondly, the newly-created position of Assistant Horticultural Education Specialist, approved by the Executive Committee for 1983, cannot be filled until the Specialist is on staff. Consequently, Tommie Waidmann, who is assuring continuity of programming, getting out the newsletter and handling the numerous other tasks of the department, continues to do a job already recognized as one requiring two staff members to perform all the functions. In spite of the challenges she has faced in running a department totally new to her, she has done exceptionally well to keep the newsletter on schedule while developing new and innovative classes and educational programs for

**BULBS: HOW TO SELECT, GROW AND ENJOY.**

George Harmon Scott. Tucson: HP Books, 1982.

SB 425 S4668

Some gardening books may be dismally derivative. Bulb books, for example, invariably say the same things in pretty much the same language about the same plants: pages and pages about daffodils and oodles of unreadable prose about tulips. These and two or three other genera aside, the rest of the cormous, bulbous and tuberous universe of plants are breathlessly relegated to a few pages of "Minor Bulbs" as if Mother Nature were somehow prejudiced.

Now here HP Books has gone and published **Bulbs, How to Select, Grow and Enjoy** by George Harmon Scott. This superbly illustrated and informative book (which sounds fresh on every page, full of the genuine experience of its knowledgeable author, rather than cullings and repetitions) reveals dozens of unfamiliar, and spectacular bulbous plants you won't find pictured elsewhere. The information conveyed about them is accurate, if a trifle conservative. Crocosmias, for instance, are quite hardy here in zone 5 when planted among rocks and even Agapanthi have been grown successfully in a few local gardens. Accurate, well written, informative—full of good pictures and drawings: what are the publishers trying to do, go bankrupt?

Panayoti Callas

**THE COMPLETE VEGETABLE GARDENER.**

Peter Seabrook. Maidenhead, England: Intercontinental Book Productions, 1976.

SB 321 S342

Overall this is a fairly average book on vegetable gardening. There are some features that would be very handy to the novice gardener. Each vegetable mentioned has a nice line drawing of what the seedling stage looks like. This speaks to the common problem facing new gardeners. What's the difference between weeds and the vegetable seedling? The same diagrams are also used to show what distances should be maintained between the plants at maturity.

Another point well made is that of plot rotation for disease control and how to prevent nutrient depletion. The author has demonstrated a simple, easy to follow plan that should be easily extrapolated to one's own garden. Mr. Seabrook stresses that a small garden (10' x 12'), well managed, is of greater value than a larger garden. It is much easier to add a bit of new garden after each successful year than it is to deal with a garden that is too large from the outset.

On balance, this is a book which has some good points worth looking into if one is just getting started but would be of limited use to the gardener who has been at it seriously for a few years.

J. B.

**John Verbliscar**, a DBG member, lived with a Japanese family for six weeks during a three month tour of Japan.

**Leonard Mullis**, a retired academic librarian, is a library volunteer.

**Panayoti Callas** is the curator of the alpine garden at DBG.

**John Brett** is DBG Community Gardens Coordinator.

**THE GOURMET VEGETABLE GARDEN.**

Theodore James Jr. New York: E. P. Dutton, 1982.

SB 321 J3551

This is a book of limited value. Mr. James mentions some vegetables that are not ordinarily grown or that are not readily available, but that is about the extent of its value. Beyond that there is little information of consequence to be gotten from this book. Much of the information is inadequate or inaccurate and some of it is just plain wrong.

Many of the gardening instructions would leave a garden novice bewildered and frustrated. The cooking instructions are frequently sketchy or refer the reader to a different book for directions on use.

If you want to get some ideas for new or different vegetables to grow, give this book some attention but don't expect to get much more than that. The concept of the book is a good one but has been done before with much greater success.

J. B.

**CARNATIONS.** Steven Bailey. 1982.

**CLIMBERS & WALL PLANTS.** Peter Q. Rose. 1981.

**RHODODENDRONS & AZALEAS.** Mervyn S. Kessell. 1981. Poole, Dorset, England, Blandford Press.

Although all these books were written and published in Great Britain, each contains information from which the local gardener can learn.

In **Carnations**, Mr. Bailey devotes the largest part of his book to the culture of perpetual flowering carnations, i.e. the greenhouse flowers. Color illustrations of these as well as of hardy border carnations and hardy garden pinks demonstrate beautiful examples of cultivars. Since the border carnations and the pinks are such good providers of color, continuous bloom and excellent cutting flowers, this book should prove interesting not only to the greenhouse growers but also to the outdoor gardener interested in growing perennials.

The approach in **Rhododendrons & Azaleas** differs somewhat. Besides culture, the history of the genus is reviewed. Mr. Kessell includes eight appendices listing the following:

- 1) Hardiness, flower color and merit, date of flowering as well as the leaf habit and merit.
- 2) Hybrids for small, medium-sized and large gardens also listing the above attributes.
- 3) Plant associations presented by garden size. By plant association, the author refers to bulbs, corms, tubers, herbaceous perennials, trees and shrubs which will grow well with rhododendrons.
- 4) Windbreaks for the protection of plants.
- 5) Available fertilizers and their suitability for rhododendrons.
- 6) British, American and other national rhododendron societies.
- 7) British, Canadian and American gardens open regularly to the public and containing a representation of rhododendron species.
- 8) British and American nurseries supplying rhododendron species, varieties and cultivars.

Mr. Rose's book on climbers and wall plants discusses the use of these plants as well as their culture. 110 pages are devoted to descriptions of climbing plants which note origin, derivation of name, hardiness, uses and habit.

A list of plants for selected sites, a glossary, bibliography, U. S. hardiness map are followed by a general index.

The reader will find these books quite similar in format providing adaptable information and many beautiful colored illustrations.

Solange G. Gignac

## Gardening Tips for January

January is not generally a time of year when one would think about the garden. Yet, in most years we can expect open, sunny, almost shirt-sleeve-type weather during which you can do certain things in your yard.

It is a good time to make an inspection of the condition of trees and shrubs and perhaps even do some final cutting back of the remaining perennial tops.

There is nothing wrong with doing some pruning this time of year, particularly on your deciduous trees. Without the foliage on them, you are better able to take a more critical look at the scaffold branching of the trees and make some improvements.

### *Preventive Maintenance*

Many areas in Colorado are plagued by heavy, wet snowstorms which occur during periods when the foliage is still on the trees. Limbs that have narrow crotch angles are the first to break. Where possible, these should be eliminated, depending on the type of tree. It is not possible, of course, to remove narrow upright branches in a tree such as Lombardy Poplar because this is the very habit of the tree.

Selective removal of the weaker branches in the Silver Maple, cottonwood, willow and Green Ash and other more desirable trees can be good preventive maintenance, warding off disastrous limb breakage later on.

### *New Concept in Pruning*

You may be accustomed to removing limbs with a cut very flush with the trunk or branch that remains. This has long been the advice. Research by Dr. Alex Shigo, U.S.D.A. Forest Service Scientist, has now proven that such advice is not correct. The cut should be made just outside the branch "collar" or "flare." This means leaving a slight bump. Dr. Shigo found that a flush cut removes a zone containing natural barriers to decay organisms and also reduces chances of good healing.

On the other hand, long stubs must not be left either. Stubs will either die back and eventually produce decay in the tree, or they may produce sucker sprouts. These always result in a weaker branch.

Whether or not to apply a tree paint or wound dressing is more or less a matter of personal taste. Wound dressings may make the cut area look better, but there is now ample proof, through research, that wound dressings do not promote healing nor reduce organisms. In fact, it has been found in some instances, they harbor spores and various fungi that cause problems later on. Wounds are better left dry than to paint them and try to keep them moist.

### *Cabling Is An Insurance Policy For Your Tree*

If your tree has limbs that cannot be removed because doing so would destroy the shape of the tree, yet the tree is weak because of narrow crotch angles, you can install cables and braces. This is an old policy which takes some specialized equipment and might best be done by an arborist. When properly done, it is a permanent installation which can be quite expensive, but in valuable trees it can be a worthwhile "insurance policy."

### *Deep Water If Soil Is Dry*

January can often be open and dry. This is the time of year when many trees and shrubs will suffer from inadequate moisture, particularly if we have cold, windy periods with bright sun. If the ground isn't frozen and there has been little precipitation, choose a sunny day to water your trees and shrubs. I've found the best method is to use a hose-attached soil needle such as the Ross Root Feeder. To do this properly, insert one-half the length of the needle into the ground, leaving it no more than a minute or so, then moving it six to eight inches. This should be done in a circle around the tree, extending from the "drip point" to several feet beyond. When inserting the soil needle, it is important to angle it away from the tree rather than toward it. This will help to promote spreading of the roots rather than confining them into a tight ball. This is particularly important

with relatively recent plantings. Sometimes the roots going from a good soil in the root ball will have difficulty making the transition into the normally poorer surrounding soil. The soil needle helps roots make this transition by leaving channels for them to follow.

Deep root watering should be done at least once each month during the winter months. Do not attempt it, however, when the ground is frozen hard.

### *Forcing Trees and Shrubs*

About mid-month you can begin forcing blossoms of some trees and shrubs. Forsythia, peach, plum, cherry and flowering-quince are among the easiest. Make sure branches have fat flower buds on them. Flower buds will be rounded or globe-shaped. Mash base of stems with a hammer and place in a deep container. Stems should be in at least six inches of water. Put arrangement in a heated room away from direct sun. Buds should swell and open in 7-10 days.

Dr. James Feucht, Professor  
Department of Horticulture  
Colorado State University

## CHRI Takes Action for Colorado's Growing Concerns

What does the Denver Botanic Gardens integrated pest management program have in common with Dutch elm disease studies at C.S.U. and a project to identify the best tomato varieties for the home garden? All three of these programs are among over 50 horticulture research or education programs funded by Colorado Horticulture Research, Inc. (CHRI).

CHRI was founded in 1974 and since that time has awarded more than \$75,000 in grants to qualified individuals or organizations—like the Botanic Gardens—which are conducting horticultural programs and research. CHRI is the largest non-profit body in the State of Colorado with the sole purpose of generating and allocating funds to advance horticulture through research, education and cultural programs.

Some of CHRI's grants have funded projects to solve critical plant problems such as Dutch elm disease and Thyronectria disease of honeylocusts. Other grants have helped horticulturists develop drought tolerant varieties of Kentucky bluegrass and other plant materials for landscape use. Still other grants have been used to monitor fruit and vegetable yields that will thrive in Colorado's growing conditions. Educational grants have, for example, funded research for a book on the history of Colorado's changing landscape and a project at the Denver Public Library to preserve landscape architect, Saco Rienk DeBoer's works.

Until recently, these grants were made possible almost exclusively through proceeds of the Colorado Garden & Home Show. While the show continues to support CHRI, its directors have recently announced plans to increase the support base through an endowment fund. The new "Endowment for Colorado's Growing Concerns" will hopefully expand CHRI's research and educational program capability by providing a perpetual financial support base.

In addition to seeking support for the fund from horticulture-related industries, CHRI is also soliciting support from individuals who are concerned about horticulture in our state.

For further information on how you can support CHRI, please call the CHRI office at (303) 425-0814. You may address any inquiries to CHRI, 3895 Upham, Suite 150, Wheat Ridge, CO 80033.

## New Telephone Number

To grow is to change and the Gardens indeed have done both. One recent change is that of our telephone number. To reach a staff member, our new number is 575-3751. Our general information number regarding hours, services and special attractions remains the same—575-2547.

Many have had trouble getting through to the Gardens due to the changes in both the telephone system and the number. We are sorry for any and all inconveniences you may have encountered.



# SCHEDULE OF EDUCATIONAL CLASSES

Winter, 1983

—Register for classes — Pay no gate fee—

**PLANT IDENTIFICATION.** January 5-February 9 (6 weeks) Wednesdays. 1 to 3 p.m. Classroom B. Instructor: Ina Cherington. Fee: \$30 for members, \$50 for nonmembers. Limit 25.

Learn to recognize and identify the plants that grow in the Denver area. This is a particular challenge in the winter but an excellent time to look at bud and branching patterns. Specimens will be examined in class. Weather permitting, walks will be taken around the Gardens.

**SLIDE LECTURE SERIES.** January 8-February 26 (8 weeks) on Saturdays. 1:30 to 3:30 p.m. Mitchell Hall. Instructor: Dr. Oksana Ross. Free. All are welcome.

"Art in Nature" is the theme of this series. Individual topics to be covered in this free series are: Discovery of Naturalism in the Italian Renaissance; Interpretation of Nature in Rococo France; Impressionism of Nature; German Impressionism; and Art and Nature in America Today. These multi-media presentations will encompass lectures, slides and appropriate musical selections played by Dr. Ross to emphasize the treatment of nature in each era discussed. The final session of February 26 will be a field trip to the Denver Art Museum led by Dr. Ross.

**FAMILY LECTURE SERIES.** January 9-March 27 (12 weeks) on Sundays. 12:45 to 1:45 p.m. Classroom C. Instructor: Dr. Margaret Goodhue. Fee: \$18 for member families, \$30 for nonmember families, \$12 for adult single members, \$18 for adult single nonmembers.

Those people interested in the world of plants will have a rare opportunity to learn something of the *History of Botany*. The course will begin with the rise of ancient science in about 1000 B.C. The writings of Hippocrates, Aristotle and Theophrastus will be examined. Did you know Theophrastus is known as the "father of botany"? The further development of botany leads to the 1st century when the importance of herbs as medical applications first became known. By natural progression this series will include accomplishments in botany from the Middle Ages to the present. Good audio-visual support will accompany these lectures which should appeal to students in Jr. High School and all upper level students and their families.

**ART IN NATURE.** January 10-February 28 (8 weeks) on Mondays. 10 to 12 noon. Classroom B. Instructor: Dr. Oksana Ross. Fee: \$32 for members, \$47 for nonmembers. Limit 25.

Learn to draw from nature, translate your black and white studies into color from charcoal and conte into pastels and mixed media. Bring a large sketch pad and charcoal to the first class.

**COLD FRAMES, HOT BEDS.** January 10 (Monday). 7:30 to 9:30 p.m. Classroom A. Instructor: John Brett. Fee: \$5 for members, \$6.50 for nonmembers. Limit 30.

Get a head start on spring planting! The use of free energy sources for starting vegetables and bedding plants in your home will be explained.

**PERENNIAL GARDENING.** January 13 (Thursday). 9:30 to 11:30 a.m. Classroom C. Instructor: Andrew Pierce. Fee: \$8 for members, \$12 for nonmembers. Limit 30.

A review of perennial gardening with emphasis on plant materials, designing borders, methods of propagation and proper planting techniques. The fee includes a book on garden perennials to be distributed in class. Second class on Friday, January 14.

**TOUR OF THE DENVER BOTANIC GARDENS LIBRARY.** January 10 (Monday). 10 to 11:30 a.m. Library Instructor: Solange Gignac. Free.

Review the article about our library in the December issue of the newsletter and then come and tour this valuable facility. For those members who seldom, if ever, use the library, this would be a fine time to become acquainted.

**PERENNIAL GARDENING.** January 14 (Friday). 9:30 to 11:30 a.m. Classroom C. Instructor: Andrew Pierce. Fee: \$8 for members, \$12 for nonmembers. Limit 30.

This is a very popular class and is often filled before many have an opportunity to register. Select the day most convenient to attend. Registrations will not be accepted from one individual for both days. The fee includes a book on garden perennials.

**ADVANCED ENVIRONMENTAL AWARENESS FOR PRE-SCHOOLERS.** January 15, February 12, March 12, April 9, and May 14 (Saturdays). 10 to 11:30 a.m. Classroom B. Instructors: Heidi Fine, Jeanette Street.

This class is *only* open to those parents and children who attended the previous class.

**WORKSHOPS FOR HOMEOWNERS.** (A series of 6 workshops). 8:30 to 12 noon with a coffee break. Saturdays, January 15, February 12, February 26, March 5, March 19, April 9. Classroom C. Instructors: Alan Rollinger and Larry Watson. Fee: \$40. Limit 60.

Learn how to avoid the hit and miss approach to landscaping your home grounds. These workshops are designed for the beginner, those who are not beginners but need help or for those wishing to give a new look to an old landscape. These lectures will be reinforced with appropriate visuals so that you will be able to see as well as hear about the proper techniques homeowners should follow to avoid expensive mistakes in buying, selecting, planting and the care and maintenance of plant materials. Following is a brief description of each of the workshops and the material to be covered in each.

*January 15:* Plants with Low Water Requirements. Learn the value of the proper use of those plants which thrive well, even in our semi-arid climate. An attractive landscape can be attained and maintained by using plants that require little water once they are established. Plants such as these can also be classified as low in maintenance.

*February 12:* Ground Covers. How should ground covers be used attractively in difficult areas to enhance the beauty of a yard? There are many appropriate ways of incorporating attractive ground cover plants in your home grounds without resorting to the use of sod, gravel or stones.

*February 26:* Shrubs. Common shrubs used to accent your home and its surroundings. Those not so common but frequently avoided or misplaced in the landscape. Growing habits, the ultimate size and form of shrubs will be discussed and shown so that an appropriate plant will grow in the area selected.

*March 5:* How to Buy Nursery Stock. Learn what to look for during this session. How to select healthy merchandise. What are the standards for nursery stock. Be sure you get what you pay for and that your landscaping budget is well spent. Don't plant disasters, avoid them!

*March 19:* How, When and Where to Plant. Balled and burlapped vs. bareroot stock will be discussed. Spring vs. fall planting. Learn how you can expect the greatest potential from nursery stock properly planted at the proper time in its proper place in your yard.

*April 9:* General Maintenance. This session covers all you need to know about the proper care of your valuable plants—when to water, how to water, when to fertilize. A general wrap-up of the entire series will be given so that you can plan and plant your new yard or rejuvenate an old one with confidence and with ultimate success.

**FAMILY FILM FESTIVAL.** Sundays, January 16, January 30, February 6, February 20, March 6, March 20, April 3, April 17. Classroom C. 2:00 to 3:30 p.m. Instructors: Heidi Fine, Jeanette Street. Fee: Member families \$24, nonmember families \$40. Limit 75 persons.

This Family Film Festival scheduled *every other* Sunday is designed to be a Discovery Series for Families with children from 4 to 12 years of age. The children must be accompanied by at least one parent or guardian. The selected films are exciting and will appeal to both parents and children. They are all about the wonderful world of plants and short lectures will accompany the films. The series will be divided into 8 sections. Some of the film titles are listed as follows: *Section I, Trees*: 1. A Tree Grows for Christmas. 2. Trees Grow through the Years. 3. A Walk in the Forest. 4. Beauty and Joy of a Forest. 5. From Trees to Paper. *Section II, Green*: 1. Philly Philodendron. 2. The Gift of Green. 3. Flowers at Work. *Section III, Tropical Plants*: 1. The Great American Chocolate Factory. 2. The Amazon Family. 3. Coffee Production in Latin America. *Section IV, Seeds*: 1. Cactus—a Profile of the Plant. 2. Plant Traps—Insect Catchers of the Bog. 3. Plant Tropisms and other Movements. 4. A Taste of Paradise, Pineapple. *Section VI, Mountains*: 1. Rocky Mountains. 2. Gymnosperms. 3. Watch Out for My Plant. *Section VII, Boabab*: Portrait of a Tree. *Section VIII, Special Plants*: 1. Life of the Molds. 2. Plants that Have no Flowers or Seeds. 3. Poison Plants.

Space does not permit descriptions of each film but if you've ever wondered about life styles in a rain forest, how a candy bar relates to a chocolate plant, what a French lady might do with a bean seed, what makes plants move or the story of Johnny Appleseed, then the whole family will enjoy this Discovery Series at the Gardens.

**INDOOR LIGHT GARDENING.** January 26-February 23 (Wednesdays). 7:30 to 9:30 p.m. Classroom B. Instructor: Bill Agee. Fee: \$18 for members, \$33 for nonmembers.

This class will show you how you can grow beautiful flowering plants in your home under artificial light. With little investment, you too can become an expert with a "green thumb."

**ROCK ALPINE GARDEN WORKSHOPS—"The Big Four."** January 27, February 7, February 15, February 23. Classrooms B and C. 7:30 to 9 p.m. Instructor: Panayoti Callas assisted in each class by Gail Boyd, Clari Davis, Sandra Snyder and Mary Fee. Fee: \$30 for all sessions, \$15 for each single session. Limit 45.

If you wonder how to obtain and grow some of the unusual plants in the Rock Alpine Garden, attend one or all of the workshops on the "Big Four"—the most prominent families in the Rock Garden. A short slide presentation will be followed by a demonstration of cultural practices using live plants, seed and seedlings, followed by a question and answer period. There will be a book display provided by the Helen Fowler Library in addition to a handout on nursery sources and cultural notes. *The Gentian Family, January 27*: This family is

dominated by the Blue Gentians of the Alps and Himalayas. There are many easily grown gentians that can be grown from seed and cuttings, as well as by division. Panayoti Callas will be assisted by Clari Davis for this session. *The Primrose Family, February 7*: This includes Rock Jasmines and Shooting Stars in addition to the hundreds of sorts of primroses that crowd mountain heights throughout the world. This family is especially easy to grow from seed. Panayoti Callas will be assisted by Gail Boyd. *The Saxifrage Family, February 15*: Includes tiny alpine scree plants of course, but many vigorous meadow, big and woodland plants as well. There is a saxifrage for almost any garden and most are easily propagated by division. Panayoti Callas will be assisted by Mary Fee. *The Dianthus Family, February 23*: Includes not only the dozens of species and hybrids of wild pinks, but gypsophila and sandwort as well. These are perhaps the easiest of the "Big Four" for Colorado gardens. Panayoti Callas will be assisted by Sandra Snyder.

**VEGETABLE GARDENING.** January 31, February 7, February 14 (Mondays). 7:30 to 9:30 p.m. Classroom A. Instructor: John Brett. Fee: \$20 for members, \$25 for nonmembers.

Many of the hows and whys of vegetable gardening will be discussed in this class. The subject will be approached from an integrated viewpoint with an emphasis on organic gardening in the Front Range.

## Tributes

**In memory of Dr. John C. Frye**

Dr. and Mrs. Robert Kosanke

**In memory of Mrs. Anna Reynolds Morse Garrey**

Dr. William G. Gambill, Jr.

Elizabeth E. Grindlay

**In memory of Mrs. Bayard K. Sweeney, Jr.**

Mrs. William V. Hodges

**Contributions of cash, goods, or services have been received from the following friends:**

American Hemerocallis Society, Region 9

American Iris Society Convention 1982

Anonymous

Colorado Garden Home Show

Colorado Native Plant Society

Denver Bonsai Club

Friendly Gardeners Garden Club

Glass Artist's Fellowship

Littleton Garden Club

Mr. and Mrs. William R. Thurston

## REGISTRATION FORM

DENVER BOTANIC GARDENS

909 York Street

Denver, Colorado 80206

The enclosed check, in the amount of \_\_\_\_\_, is to cover the registration fee for the following class.

Name and section of class \_\_\_\_\_

I understand that after this class has met once, the fee is not refundable.

Mr.

Mrs.

Miss

Ms. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Home Tel. No. \_\_\_\_\_ Business Tel. No. \_\_\_\_\_

Member of Denver Botanic Gardens ☐ Yes ☐ No



DENVER BOTANIC GARDENS

909 York Street • Denver, Colorado 80206

EDUCATIONAL CLASSES

Fees for courses should be paid in advance by check or money order made out to Denver Botanic Gardens. Fees should be sent in with the completed registration blank not later than one week prior to the first meeting of the course so that materials may be ordered as needed. Since the space is limited in many courses, registration should be mailed in promptly. Your registration will NOT be acknowledged. Your name will be placed on the class list on the day your money is received. No enrollments for fee class by phone please. All courses are given subject to a minimum enrollment of ten students. For further information, please call 575-3751.

# UPCOMING EVENTS for JANUARY

1) All Day	HAPPY NEW YEAR	18)* 7:30 p.m.	Classroom B	Denver Bonsai Club
4) 7:30 p.m. Classroom B	Denver Bonsai Club	19) 7:00 p.m.	Mitchell Hall	U. S. Forest Service
6) 7:45 p.m. Mitchell Hall	Denver Orchid Society	19) 7:30 p.m.	Classroom C	American Rock Garden Society
7)* 11:00 a.m. Main Room, House	Civic Garden Club	20) 7:30 p.m.	Classroom B	Indoor Light Gardening Society
8)* 9:30 a.m. Classroom B	Gloxinia Gesneriad Growers	21) 7:30 p.m.	Classroom C	Denver Botany Club
10)* 9:30 a.m. Main Room, House	The Associates Board	22) 1:00-4:00		
11)* 11:00 a.m. Classrooms B, C	Garden Club of Denver	p.m.	Mitchell Hall	Ultra Violet Club Plant Sale
11) 7:30 p.m. Classroom A	Colorado Cactus Society	23) 10:00-4:30	Mitchell Hall	Ultra Violet Club Plant Sale
12)* 9:00 a.m. Main Room, House	DBG Guild	24) 9:30 a.m.	Main Room, House	Ultra Violet Club
12) 7:00 p.m. Mitchell Hall	U. S. Forest Service	25)* 4:00 p.m.	Main Room, House	Board of Trustees
15)* 9:00 a.m. Classroom C	Colorado Forestry Association	26)* 10:00 a.m.	Main Room, House	DBG Plant Sale Committee
15)* 9:30 a.m. Classroom A	Hi Country Judges Workshop	27) 9:30 a.m.	Classroom B	African Violet Society of Denver
15)* 10:00 a.m.	"Environmental Awareness"	27)* 10:00 a.m.	Main Room, House	Around the Seasons
	—Ms. Heidi Fine	27) 7:30 p.m.	Main Room, House	Men's Garden Club of Denver
		28)* 9:00 p.m.	Mitchell Hall	Ikebana International
17)* 7:30 p.m. Classroom B	The Nature Conservancy			

\*Members or Enrollees only

## Announcements of Interest

The Botany Club will meet at 7:30 p.m. January 21 in Classroom C. Dr. Richard Schwendinger will give a slide presentation on various botanic gardens. This program had been scheduled for the November meeting but it was necessary to reschedule it in January. Don't miss this excellent presentation.

The Gloxinia Gesneriad Growers (3 Gs) and the Ultra Violet Club will present a double flower show and sale on January 22 and 23, 1983, in Mitchell Hall at Denver Botanic Gardens. This is the second annual show for the Ultra Violet Club and the fourth show for the 3 Gs. There will be two separate shows and the theme for both is, "A Thing of Beauty."

The show and sale will be open to the public on Saturday, January 22 from 1:00 p.m. to 4:30 p.m., and on Sunday, January 23, from 10:00 a.m. to 4:30 p.m.

The latest in African violets and other gesneriads will be on view. Come and enjoy. For information call Peg Agee, show chairman for Ultra Violet Club, 755-2336, or Bonita Hutcheson, show chairman for 3 Gs, 781-2406.

The Annual Membership Dinner will be Wednesday, February 23. Mr. Edward P. Connors will give an illustrated talk on the history of the annual garden from its continental origin. Additional details will be provided in the February issue of the newsletter.

An African Violet sale, sponsored by Hi Hopes Study Club, will be held from 10:00 a.m. until 4:00 p.m. on Saturday, February 26, in Mitchell Hall.

Blooming plants, starter plants of new hybrids and old favorites, leaves, trailers, miniatures and gesneriads will be available. The proceeds of this sale will be used to purchase a lifetime membership to the African Violet Society of America for each member of the Study Club. The Gardens will also receive a percentage of the proceeds.

The newest area gesneriad club has chosen its name from the many facets of early Colorado history and will be known as the Gilded Garter Gesneriad Growers (4 Gs). The club meets the first Wednesday of each month at 7:30 p.m. Visitors are welcome. Come and learn more about the blooming, trailing plants that will grow in your windowsills. For more information call Emma Lahr at 771-5200 or Isla Montgomery at 355-4991.

Denver Botanic Gardens, Inc.  
909 York Street  
Denver, Colorado 80206  
303-575-3751

Non Profit Org.  
U.S. Postage  
PAID  
Permit No. 205  
Denver, CO

TIME VALUE

January 1983

Address correction requested



# Green Thumb Newsletter



Number 83-2

Denver Botanic Gardens, Inc.

Editor—Tommie Waidmann

February 1983

## Distinguished Lecturer To Speak On Urban Horticulture

Elizabeth Scholtz, Vice President of Brooklyn Botanic Garden—a major, urban U.S. Botanic Garden founded in 1910—will be the first invited lecturer to speak at Denver Botanic Gardens in the 1983 Invited Lecture Series. John C. Mitchell Hall will be the site of her lecture on Friday evening, March 18th, from 7:00-9:00 p.m. Miss Scholtz's topic, "Urban Horticulture" focuses on the premise that cities need not be jungles of concrete and steel. She will explain in her presentation the impact that urban botanic gardens can have working with community groups to beautify vacant lots and blighted neighborhoods, as well as presenting creative ideas for gardening in backyards and on terraces.

After serving as Director of the Brooklyn Botanic Garden from 1971 until 1980, Elizabeth Scholtz became Vice President of the Garden. As Director she was responsible for the 50-acre Botanic Garden in Brooklyn; the 223-acre Kitchawan Research Station in Ossining, New York; the 400-acre Teatown Lake Reservation and the 12-acre Clark Garden in Albertson, Long Island, New York. Prior to her appointment as Director, Miss Scholtz served with the Instruction Department of Brooklyn Botanic Garden from 1960-1971 as head of the Adult Education Program. Her work in dye plants led to a collaboration in the publication of "Dye Plants and Dyeing," a handbook of the *Plants and Gardens* series published by Brooklyn Botanic Garden. She also collaborated on production of the documentary film "Nature's Colors—The Craft of Dyeing With Plants."

Born in South Africa, Miss Scholtz received her B.S. degree in botany and zoology at the University of Witwatersrand. She holds a certificate in Medical Technology and collaborated on several papers of a medical nature while she was in charge of the laboratory in Groote Schuur Hospital, Cape Town, South Africa. She served a fellowship in hematology at Yamins Blood Laboratory, Beth Israel Hospital, Boston, Massachusetts. In 1981, Miss Scholtz received Swarthmore College's distinguished Arthur Hoyt Scott Garden and Horticulture Award for having "devoted her career to inspiring people's interest in horticulture—from the smallest child to fellow professionals". She was recognized by the American Horticultural Society in 1978 with its Professional Citation. Also, Miss Scholtz holds an Honorary Degree of Doctor of Humane Letters from Pace University, New York, and in June 1982, was conferred an Honorary Degree of Doctor of Science from Long Island University, New York.

Miss Scholtz serves on the Visiting Committee of Old Westbury Gardens, is on the Board of the Magnolia Tree Earth Center, and is Chairman of the Publication Awards Committee of the American Association of Botanical Gardens and Arboreta. She was a member of the Visiting Committee of Longwood Gardens, was on the Advisory Board of Morris Arboretum and a Board Member of AABGA.

With her appointment as Vice President of the Brooklyn Botanic Garden in 1980 Miss Scholtz has been able to devote much of her talent and energy to leading horticultural tours for the Botanic Garden to many places around the world as well as writing and lecturing on a wide range of botanical subjects. We are fortunate to have Elizabeth Scholtz speak at the Denver Botanic Gardens. You are invited to join us in Mitchell Hall on Friday evening, March 18th to welcome Miss Scholtz to Denver and learn more about the role of Botanic gardens in urban horticulture. Members of the Denver Botanic Gardens, students and senior citizens will be admitted to the lecture for \$1.00/person payable in advance (see registration form) or at the door the evening of the lecture. Nonmembers, other than students and seniors, will be charged \$2.00/person at the door the evening of the lecture.

Merle M. Moore, Director



*Elizabeth Scholtz, distinguished lecturer and Vice President of Brooklyn Botanic Gardens in New York.*

## English Gardens Talk Highlights Annual Dinner

Visits to 20 English gardens and 10 Continental ones will highlight the talk to be given by Edward Phillips Connors, a Trustee of the Denver Botanic Gardens, at the Annual Dinner for members of the Botanic Gardens on Wednesday evening, February 23.

Mr. Connors, an art historian with an extensive interest in the history of gardens, has made numerous trips to England and the Continent pursuing these subjects, and the Annual Dinner slide lecture, "The English Garden and its Continental Origins," is drawn from these visits.

Merle Moore, Director of the Gardens, said recently, "We are really delighted that Ed Connors will be talking at the dinner since he is such a lively speaker and is so knowledgeable in this field."

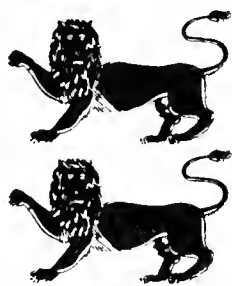
"I might note," he adds, "that with such an outstanding speaker, our recent experience shows that members should send in their reservations as far in advance as they can since space may fill up before the reservation deadline of February 15."

Inserted in this issue of the *Green Thumb Newsletter* is a full page reservation form (printed on colored paper) which should be used to sign up for the Annual Dinner. The cost of the evening is \$15.00 per member with a social hour scheduled to begin at 6:00 p.m.

Aside from his interest in the Italian and French influences on the development of English gardens up to those of the 20th century, Mr. Connors has also pursued the study of monastic gardens, though these will not be covered in his Annual Dinner talk. He has served as a Trustee of the Gardens since 1969 and is currently a Vice-President of the Board.

# NORMANDY

restaurant français



Heinz E. Gerstle  
east colfax at madison  
denver, colorado 80206.  
telephone (303) 321-3311

---

## Botanic Gardens Shares In Normandy Restaurant 25th Anniversary Celebration

---

Heinz Gerstle, owner of the *Normandy Restaurant Français* located on East Colfax Avenue at Madison, has graciously included the Denver Botanic Gardens among a select list of cultural organizations which have been invited to share in the celebration of 25 years of operation in Denver. In addition to a generous guaranteed contribution to each organization, the Normandy will also share with each a percentage of its gross sales for the months of January, February and March 1983.

Mr. Gerstle and his staff are to be commended for this exemplary means of helping to support, in his own words, "some organizations which make Denver great". This spirit of cooperation between one of Denver's finest restaurants and the benefiting cultural organizations is most welcome and to be encouraged. I hope each of you, as you consider options for dining out in the next two months, will keep in mind that an evening of fine cuisine, lovely surroundings, and excellent service in the finest European tradition at the Normandy Restaurant can be, not only a very enjoyable experience for you, but one beneficial to the Botanic Gardens as well.

The other organizations invited by Mr. Gerstle and his staff to "Come Celebrate With Us..." are the Denver Art Museum, the Denver Museum of Natural History, the Denver Zoo, the Denver Symphony, the Denver Public Library, and KRMA-TV, Channel 6.

Merle M. Moore,  
Director

---

## Gardening Tips For February

---

In Colorado, February is one of those months that can have extremely cold along with sunny, short-sleeved-shirt days. For this very reason, sunscald is a big problem with thin-barked trees.

Trees that have been planted recently are particularly vulnerable and it would be appropriate to apply a tree wrap to protect them. The commercial crepe-type wraps available in garden centers are best. They are scientifically designed to reduce the affects of sunscald.

The crepe wrapping is applied starting at the base of the tree, wrapping upward and overlapping slightly until you are above the first or second branch of the tree. A simple thumbtack is normally adequate to hold the final wind of the wrap. Avoid using wire or other materials that might cause girdling later.

The term, sunscald, is often misunderstood. The damage from sunscald is not actually caused by the direct heat of the sun, but is a dessication or freeze injury that occurs during the winter months, normally starting about mid-January when the warmth of the sun causes cells in the outer bark to become metabolically active. These cells are no longer in the dormant state and are killed when the temperatures plummet in the evening hours. The sun is at a low

angle and is more apt to warm up the southwest side of a tree, and shadows from the branches which would normally shade and protect it from fluctuating temperatures, are not cast on the trunk. This is why February is a critical month.

Tree wrap, of course, does not keep a tree warm, but rather keeps it cool. The wrap is designed to provide insulation against sudden temperature changes.

Don't be tempted to save a little money and use your own tree wrap such as cloth or burlap. Materials that absorb moisture will compound the problem, because once they are wet they will conduct heat and cold rapidly.

Another technique that is used to avoid sunscald damage is white-washing the trunk to reflect the heat. While this method works well in a fruit orchard, it leaves a rather ugly, unnatural appearance in the home grounds which detracts from the attractiveness of the landscape. The best way to have white-barked trees is to plant aspen or European white birch, which incidently, are not subject to sunscald even though they are thin-barked trees. Those that are more subject to sunscald include the young honeylocust, ash, cottonwood, and fruit trees.

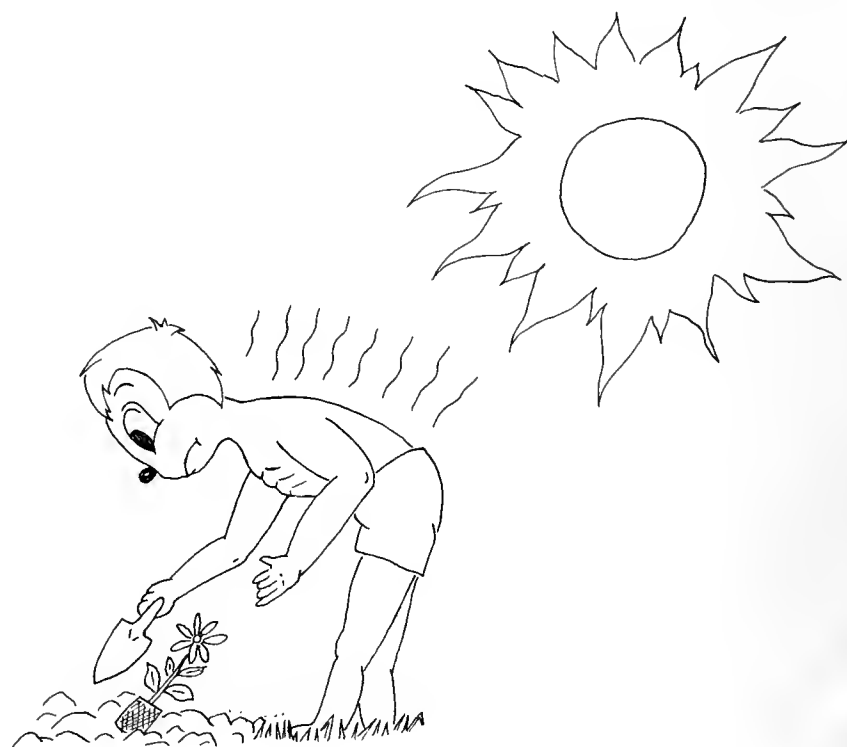
Tree wrap should be removed when the season begins to warm up, sometime in mid-April. It is best not to leave tree wrap on during the growing season, because it often harbors spores of disease fungi as well as many insects. It also prevents the tissues of the outer bark of the tree from becoming acclimated to surrounding conditions. Normally trees need only to be wrapped for the first two growing seasons after planting.

February is a good month to do some of the final pruning, with exception of hybrid tea roses and flowering shrubs which are best left until April or May. Deciduous trees and shrubs can be thinned without worrying about damage, and due to loss of foliage, it is easier to see what you are doing. Keep in mind, however, that the buds of spring-flowering trees and shrubs already contain the flowers for the summer months. Pruning at this time should be restricted to a *thinning process only*, not peripheral pruning from the tips. By thinning, I mean the removal of unwanted branches, perhaps to make the tree more symmetrical and to allow for better light penetration and the removal of those branches which interfere with each other. Of course, dead, dying or diseased branches should be removed.

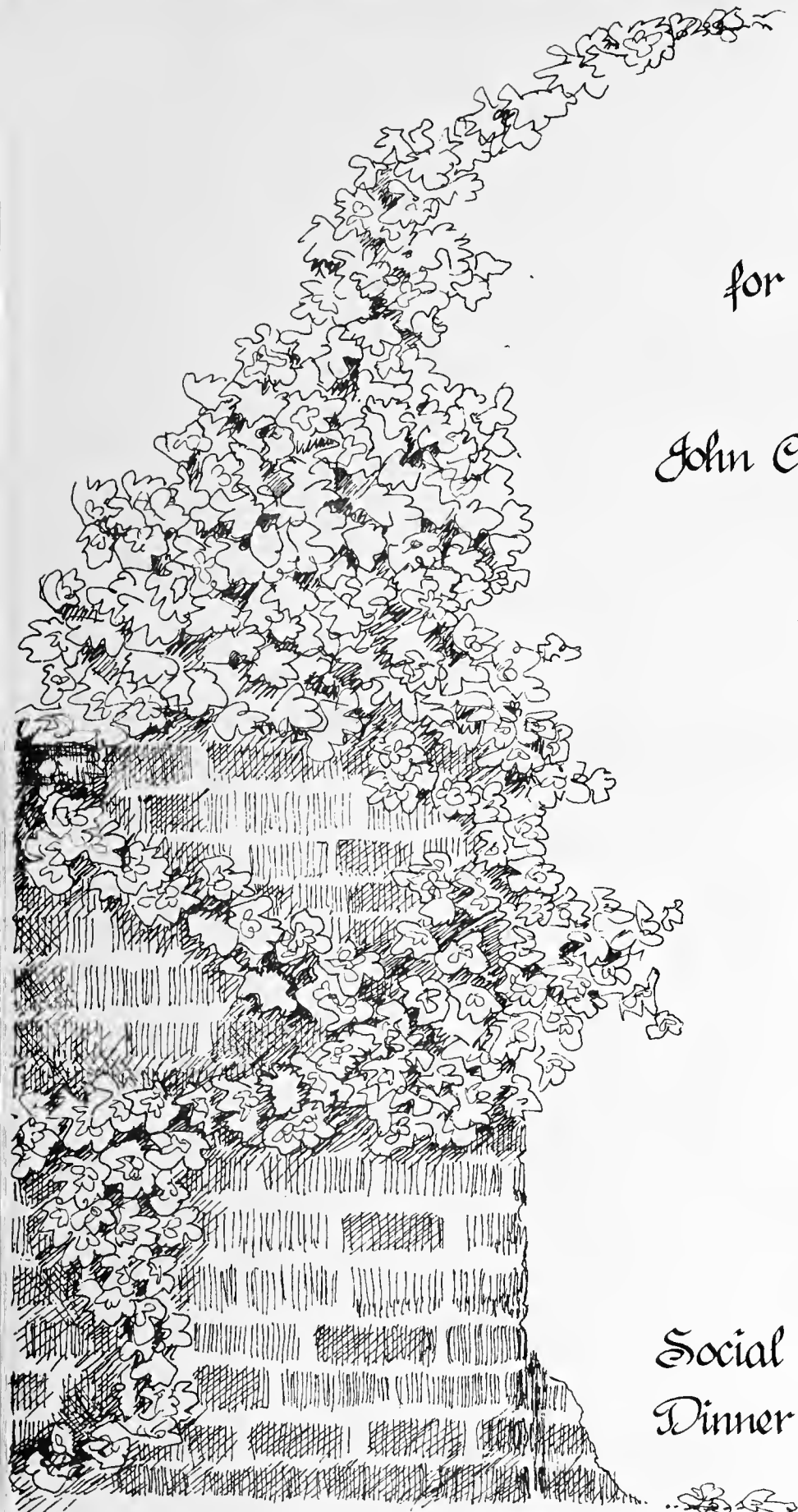
If you live near the Denver area, plan to attend the Colorado Garden and Home Show held in Currigan Exhibition Hall from February 4 through February 14.

The theme for the show this year is "Colorado—A Living History." It should prove to be an interesting and educational experience.

Dr. James R. Feucht  
Professor, Horticulture  
Colorado State University







# Annual Dinner

for members of the Denver Botanic Gardens

Wednesday, February 23, 1983

John C. Mitchell Hall, Denver Botanic Gardens

## "The Continental Origins of the English Garden"

an illustrated talk by

Edward Phillips Connors

DBG Trustee and garden historian

Social Hour 6:00 p.m.

Dress informal

Dinner 7:00 p.m.

\$15.00 per person

-----  
*Reservations are limited & are accepted on a space available basis until February 15 only.*

Kindly reserve \_\_\_\_\_ places for me at the Annual Dinner.

My check for \$ \_\_\_\_\_ is enclosed (\$15 per person).

NAME \_\_\_\_\_

Names of those attending (for name tags): \_\_\_\_\_

ADDRESS \_\_\_\_\_

TELEPHONE \_\_\_\_\_

*Please return this reservation form together with your check by February 15 to:*

Denver Botanic Gardens (attn: Annual Dinner)  
909 York Street  
Denver, Colorado 80206





# THE JOLLY GREEN GARDENER

## KNOT GARDENS

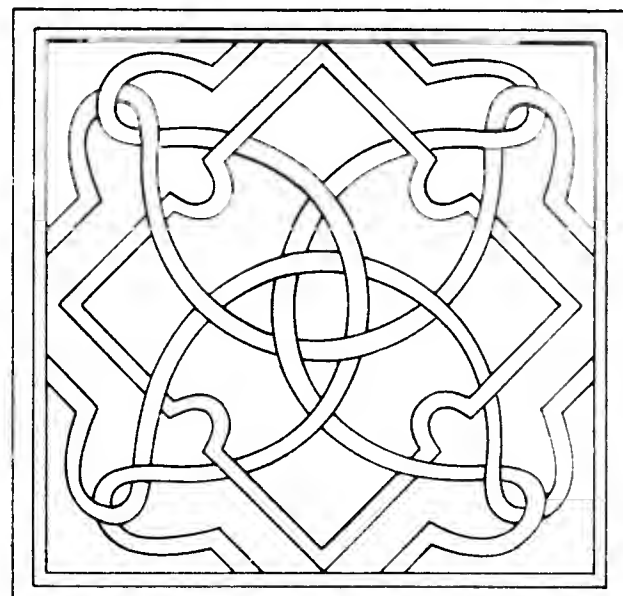
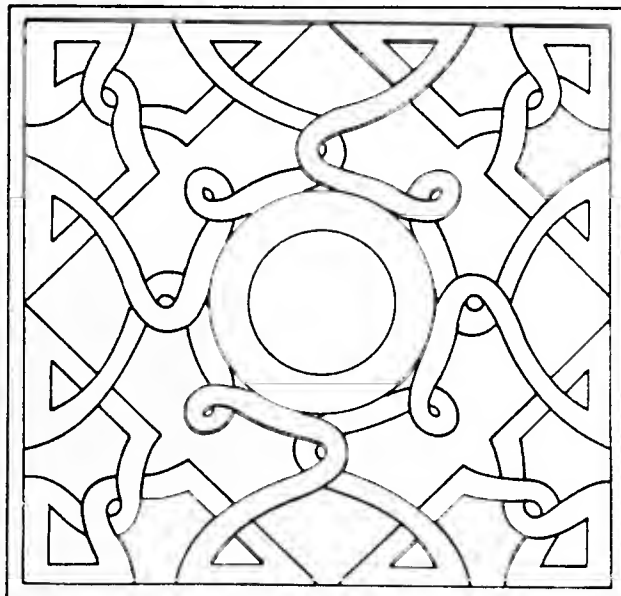
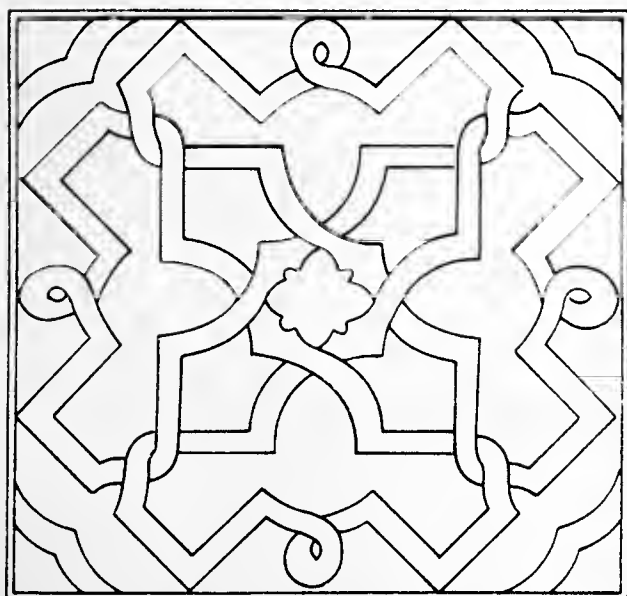
*Susan Praetz Fry*

Knot gardens are a type of **Herb** garden design that began in Europe and became very popular in England. Knot gardens are formal and **symmetrical** and can be either simple or complicated in their appearance. The idea is to create a garden filled with plants that appear to weave under and over each other. They are most interesting when viewed from above, as from a roof top. Knot gardens aren't as popular today as they were in days of old, but the Herb Garden at The Denver Botanic Gardens can offer you a look at the past.

It is winter, so now is the time to see the interesting textures and structures that surround the beds of herb plants laying silently waiting for spring. As you enter from the East, a wooden shelter called a **gazebo** will provide you with a place to sit and look out over the garden. Notice the **sundial** in the middle surrounded by a continuous circle of beds and brick walkways. Observe the stems of the plants and try to imagine what they might look like in bloom. Walk around and don't be surprised if a squirrel comes up for a curious visit or one of the neighborhood cats rubs against your leg.

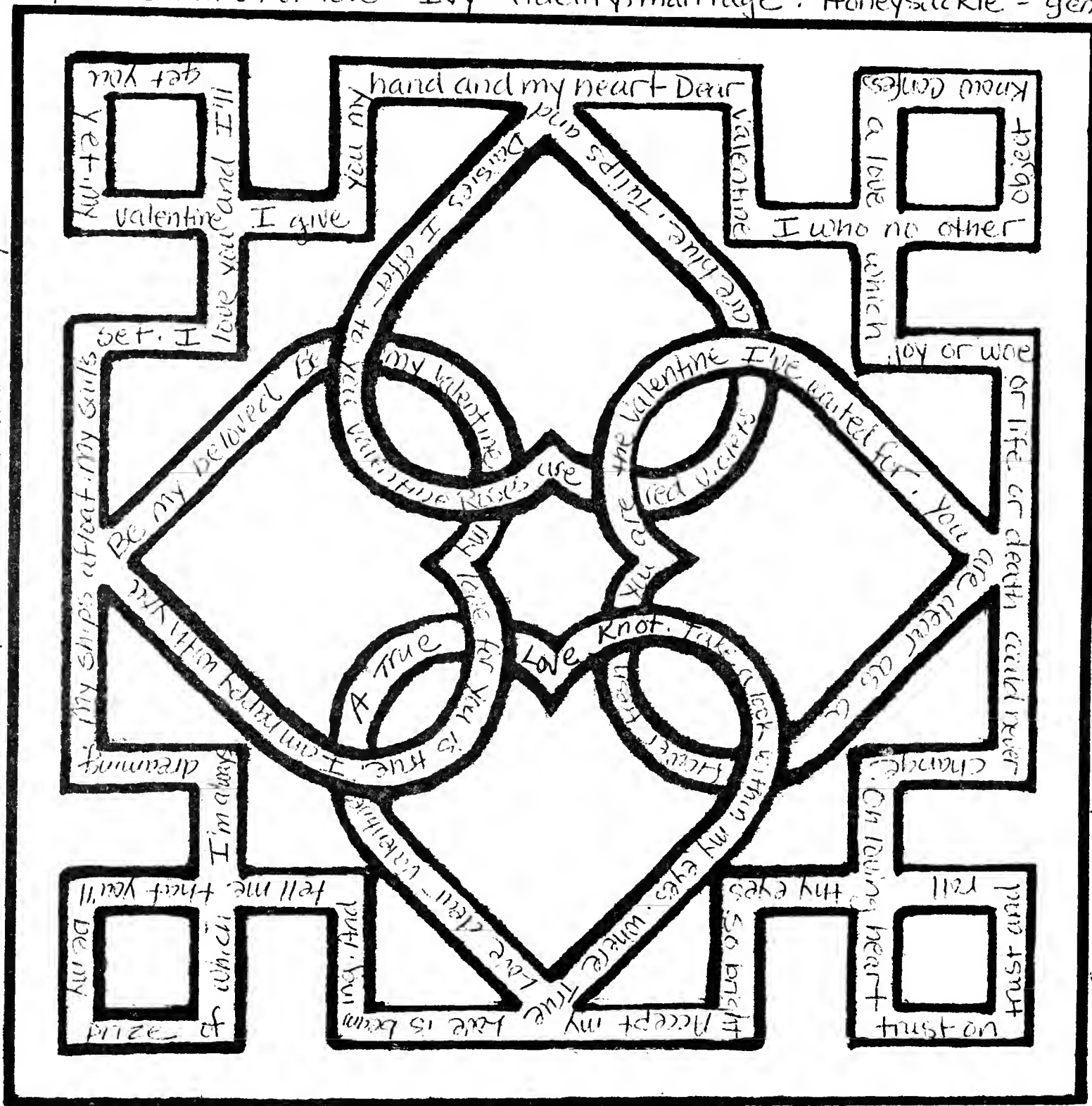
Now go under the wooden structure called a **pergola** to the West side of the Herb Garden. Here you will find the traditional Bow Knot design made of five interlocking circles. In the center is a statue called "The Boy and a Frog" designed by Louise Ward Hering. It might resemble a cupid if you use your imagination.

The Herb Garden is a fun place to visit any time of the year. Its Historical design and its collection of fragrant, cooking and medicinal herbs make it a place of great educational value. You may even decide after you visit to take out a piece of paper and design your own knot garden.





Jasmine - happiness · Violet - passion, faithfulness · Daisy - innocence



outs affection Germanium - friendship . Orchid - gaiety . Crocus - gladness

There have been certain symbols associated with valentines since the earliest hand-made cards. Long ago, people enjoyed discovering the true feelings of their valentine senders by piecing together the different symbols on their cards. For example, hearts have always been a sign of love, while to many people birds on the wing suggested courtship or marriage. Often a little cupid with his quiver of arrows expressed “desire” shot into a young love’s heart. Flowers of many varieties and colors, indicated the growing and blooming of love. The Rose, the most popular and oldest known flower meant secrecy. Blue Forget-Me-Nots stood for remembrance and the Chrysanthemums suggested sincerity. Though many of the same designs are used on valentines today, we rarely consider their symbolism in the old fashion way.

---

## Gardens Welcomes New Plant Propagator

---



*James Borland, Plant Propagator, and Gayle Weinstein, Botanist-Horticulturist, examining fruits of Lavalle Hawthorn in the herb garden.*

As Director of Denver Botanic Gardens, I am pleased to announce the appointment of James N. Borland to the position of Plant Propagator. Mr. Borland brings to his new position combined academic training in biology and horticulture as well as sound, practical experience in the propagation of a wide range of plant material. Mr. Borland's most recent position, prior to joining the Botanic Gardens' staff, was that of Plant Propagator for the Western Slope firm of Weddle Native Gardens, a nursery specializing in Rocky Mountain native plants. Working with native plant species has encouraged Mr. Borland to experiment with several different methods of determining the best propagation techniques to successfully reproduce desirable plant material. In addition, he is a meticulous record keeper, recognizing the importance of accurate notation of successful propagation methods.

Like many other programs at the Botanic Gardens today, the Plant Propagation Department goals and objectives are being reviewed, reassessed and clarified. I cannot think of a more capable person than Jim Borland to undertake this important responsibility.

I expect Mr. Borland to build upon the legacy left by Dick Schimming, who retired last August, while making his own mark as the Botanic Gardens' Plant Propagator. I have no doubt that his contribution will be every bit as great as that of his predecessor.

Merle M. Moore,  
Director

---

### Around and About The Gardens

---

At the Gardens, plants are featured throughout the year and the enjoyment of outdoor landscapes need not be seasonal. Only the emphasis shifts and if we are sensitive observers, we can learn to appreciate this.

During winter, a walk through the grounds reveals three general growth forms. The *pendulous* form of the European White Birch, *Betula pendula*, and the Niobe Willow, *Salix X Blanda*, is obvious to the casual observer. Then note the *upright* form of the Blue Stem Willow, *Salix irrorata*, and the River Birch, *Betula fontinalis*. Observe the *spreading* form of the Eastern Redbud, *Cercis canadensis* and the Cockspur Hawthorn, *Crataegus crusgalli*. These variations in growth habits may often go unnoticed when the plants are in full leaf. Notice also the various features in stem color. You will see yellows and blues on the stems of the willows; reds and brown of the birches and lindens, and shades of green of the kerrias and Scotch brooms.

With careful observation you will note that differences in bud sizes and shapes become discernible. Even the twig growth varies. On the crabapples and ginkgo there are spurs; on some plums and cherries there are pins. The redbuds zigzag and the dogwoods are sympodial. The stems of the ash and lilac are square, while on the buckeye, they are round.

In your walk through the Gardens, don't overlook the conspicuous—the bark of the trees. Young bark is often smooth. However, with age, it may split or peel or initiate patterns of its own. The bark of the ash will fissure; on the birch it will peel and on the hawthorn it will plate. Differences in bark color emerge due to the thickness of tissue or the reflection of light.

Plants in their winter condition are far from being characterless silhouettes. This is a good time to take advantage of the lack of foliage to see all that lies beneath.

Gayle Weinstein,  
Botanist-Horticulturist



---

## Special Announcements

---

*Flowers from Holland—A Spring Demonstration.* Brinkmann's Wholesale Florists Inc., in cooperation with Denver Botanic Gardens, announces an outstanding opportunity to learn from a well-known European flower designer from Holland what magic can be wrought with a spring arrangement of flowers. Flowers are the important thing, they speak for themselves, especially when they are flown in fresh daily by George Brinkmann and designed as only the Europeans know how. The latest trends and fashion in flower arranging will be demonstrated with innovative use of not only flowers, but fresh and preserved greens from Holland. You will see flower arrangements for all occasions featuring Dutch spring flowers in an array of color and variety. Ample time will be allowed for questions.

This show and demonstration will be held in Mitchell Hall on March 19 and 20 with two shows daily: 1:00 to 2:30 p.m. and again from 3:00 to 4:30 p.m. Mark your calendars now and watch for the March issue for a reminder. Members, of course, will be admitted free of charge and the public is cordially invited with a nominal fee at the gate.

---

*Workshop of Community Solar Greenhouse Operations.* Sunday, March 6, 9:00-4:30. Mitchell Hall in the morning, Classrooms A & B in the afternoon. Fees are as follows: Morning session, Solar Greenhouse Growing and Season Stretching—\$15.00. Afternoon session, The Community Greenhouse—\$3.50. The entire day—\$16.50. (See registration form.) Lunch on your own.

The Denver Botanic Gardens and the Cheyenne Community Solar Greenhouse is co-sponsoring this three-part workshop on solar gardening. The morning session entitled, "The Bountiful Solar Garden—Yearlong Food Growing," will cover all aspects of solar greenhouse growing, layout, variety selection, scheduling, pest management, etc. The afternoon session will be "Season Stretching—Extending High Altitude Gardening Seasons," and "The Community Greenhouse—A Simple Solution to many Complex Problems." The last portion will be for those individuals seriously interested in exploring the methods and requirements of establishing a community solar greenhouse.

The Cheyenne Community Solar Greenhouse, whose director is Mr. Shane Smith, is the first totally passive heated commercial greenhouse in the country. It was constructed in 1977 and to date, there has been no use of any backup heating system. This is an impressive statement if you've ever been in Cheyenne in the winter.

The greenhouse has a commercial section that offsets some of the operating expenses. Labor is provided by senior citizens, youthful law offenders working off penalties, individuals from the disabled community, plus a small professional staff to oversee the operation. In addition, there is a small community garden and wheelchair-accessible orchard on the grounds. Another aspect of this operation which has drawn considerable attention is that of season extenders—inexpensive structures which add up to 5 months to the growing season, making it possible to harvest vegetables from March to November.

Don't miss this opportunity to explore an exciting technology and a unique application of it. Mr. Smith and his assistants will show you how successful solar gardening can be accomplished.

---

*The Botany Club* will meet on Friday, February 18, in Classroom C at 7:30 in the evening. Dr. William G. Gambill Jr. will be presenting a narrated slide presentation on his recent travels to Brazil. All are welcome.

*The Colorado Cactus and Succulent Society* is pleased to announce that, in cooperation with the Denver Botanic Gardens, it will be hosting Dr. Alfred B. Lau as the initial speaker in its newly-established Sam and Mary Ann Heacock Lecture Series. Dr. Lau is a Mexican botanist whose specialty is cacti and other succulent plants of Central and South America and whose fascinating articles appear regularly in the "Cactus and Succulent Journal," a national publication.

Through his travels and explorations in the field, Dr. Lau has both discovered new plant species and varieties, and increased our knowledge of species already known. By means of seed propagation from collected plants, Dr. Lau is able to produce more seeds which he in turn, sells to cactus and succulent societies, botanic gardens, and nurseries the world over. Monies derived from such sales are used by Dr. Lau and his wife, Anni, to operate their orphanage for Indian boys in Cordoba in the State of Veracruz.

Dr. Lau will be stopping in Denver en route home from Europe, where he attended the Congress of the International Organization for Succulent Plant Study in Vienna; he later lectured to cactus and succulent societies in Great Britain. His lecture here will center around new discoveries in Mexico and will be at 8:00 p.m. on March 3, 1983 in Horticulture Hall at the Denver Botanic Gardens at 1005 York Street. The lecture is open to all wishing to attend.

---

*The staff* extends sincere thanks for the time and effort of those who have contributed to the used can drive. We particularly appreciate it when cans are already compacted and bagged. They are easier to collect and store.

We are hoping to be able to purchase a microwave oven to be installed in the prep room and made available to both the staff and any others who use our facilities. So far we have \$80 in the fund. Thank you for your continued support.

---

## Tributes

---

**In memory of Edward O. Cook**

Mr. and Mrs. J. Loren Adams

**In memory of Deborah Duty**

Anne Lyman

**In memory of Florence Fels**

Mr. and Mrs. John Falkenberg

**In memory of Mrs. Anna Reynolds Morse Garrey**

Mr. and Mrs. John Falkenberg

Garden Club of Denver

Mary Holt Joyce

Mrs. Frances E. Schlueter

Mrs. Thomas E. Taplin

**In memory of Marie V. Guy**

Harlan B. Clark

**In memory of Mr. M. Rex Jones**

Mrs. Naomi H. Jones

**In memory of Kim Sterne**

Mr. and Mrs. Bruce C. Sterne

A donation has been received from Mr. and Mrs. Bruce C. Sterne in the memory of their son, Kim Sterne, on the Fourth Anniversary of his death, February 9, 1979. This donation will go to the Kim Sterne Survival Garden at the Chatfield Arboretum.

---

**Contributions of cash, goods, or services have been received from the following friends:**

Colorado Seedsmen

Denver Mens Garden Club

Glass Artists Fellowship

Mr. and Mrs. Lloyd Sparks





*The recently completed picnic shelter provides the backdrop for socializing following the September Board of Trustees meeting at the Chatfield Arboretum site.*

## Gardening Under Light

Do you ever dream about the day your ship comes in, bringing funds for a constantly-replenished supply of blooming houseplants? Not just African violets, but begonias, fuchsias, impatiens, marigolds, ornamental peppers, and more! Even if that schooner full of dollars is slow to arrive, you can still turn dull into dynamic this winter with a surprisingly small investment. You can expand your collection of foliage houseplants by growing all of the above under fluorescent lights! It is possible to fool Mother Nature, to have fresh herbs and lettuce along with your cyclamen, all winter long, in a "light garden." Virtually every kind and variety of plant less than 18" tall may be grown to maturity without ever being exposed to daylight. The darkest corner of an apartment or home can be turned into a lush garden through the use of one or more fluorescent fixtures.

Why should you use fluorescent lights? Although incandescent lamps came first, they provide too little light and become too hot, while using energy inefficiently. Three strikes and they're out! Fluorescent lamps score well in all these factors, with the added advantage that the light source is not concentrated at one point; the light is emitted over a continuous length of useful space. Most fluorescent tubes are long and narrow; the greatest concentration of light will be in the center of and directly under each tube. Light intensity drops off away from this center, especially toward the sides. Those plants that require strong light do best near the center and from 4 to 12 inches below the tubes. You can place seedlings and young plants on suspended flower pots so they almost touch the tubes. For plants having even higher light needs or which grow over 12 inches tall, two such units can be placed side by side. Plants with lower light requirements can fill in near the ends.

Fluorescent fixtures with reflector hoods or in strip form are inexpensive and readily available. You can start a light garden by

fastening one or more of these fixtures under a shelf; "light gardeners" often begin by using existing bookcases, shelves, or spaces under kitchen cupboards. It is also easy to purchase or build a free-standing unit. Pre-fabs are available which usually just need to be plugged into a grounded socket. You can arrange a simple growing area, or one which is an integral part of your room decor.

Power loads on your electrical circuits should be checked before you start light gardening. You can begin with a common 48-inch fluorescent light unit, with two tubes of 40 watts each placed side by side under a reflector containing the ballast; most household circuits can handle this small extra demand. If your circuits are not grounded and/or if your garden grows into multiple fixtures, you may need some assistance from an electrician.

The care of your plants under lights is similar in many ways to other houseplant culture. Pest and disease control, temperature and humidity requirements are nearly the same. More fertilizer and water may be needed if your plants are growing well in this environment. Your lights should operate about 14 hours daily, unless plants that are otherwise OK show their need for additional light by weak stems and failure to flower.

Even experienced gardeners know there is always more to learn, and this is also true of light gardening. In this relatively new horticultural field, information is exchanged through The Indoor Light Gardening Society of America, formed in 1965. The Colorado Chapter meets at the Denver Botanic Gardens on the third Thursday of most months (see Calendar of Events). Programs cover construction, choice of plants, culture, and many other aspects of this hobby. In early 1983, for example, topics will include new plants for 1983 and starting seeds under lights. Chapter members will also teach a class in Indoor Light Gardening early in 1983.

## REGISTRATION FORM

DENVER BOTANIC GARDENS

909 York Street

Denver, Colorado 80206

The enclosed check, in the amount of \_\_\_\_\_, is to cover the registration fee for the following class.

Name and section of class(es) \_\_\_\_\_

I understand that after this class has met once, the fee is not refundable.

Mr. \_\_\_\_\_  
Mrs. \_\_\_\_\_  
Miss \_\_\_\_\_  
Ms. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Home Tel. No. \_\_\_\_\_ Business Tel. No. \_\_\_\_\_

Member of Denver Botanic Gardens ☐ Yes ☐ No



DENVER BOTANIC GARDENS

909 York Street • Denver, Colorado 80206

EDUCATIONAL CLASSES

Fees for courses should be paid in advance by check or money order made out to Denver Botanic Gardens. Fees should be sent in with the completed registration blank not later than one week prior to the first meeting of the course so that materials may be ordered as needed. Since the space is limited in many courses, registration should be mailed in promptly. Your registration will NOT be acknowledged. Your name will be placed on the class list on the day your money is received. No enrollments for fee class by phone please. All courses are given subject to a minimum enrollment of ten students. For further information, please call 575-3751.

# UPCOMING EVENTS for FEBRUARY

1)	7:30 p.m.	Denver Bonsai Club	Classroom B
2)	7:30 p.m.	Gilded Garter Gesneriad Growers	Classroom B
3)	7:45 p.m.	Denver Orchid Society	Mitchell Hall
5)	9:30 a.m.	Gloxinia Gesneriad Growers	Classroom B
6)*	1:00 p.m.	Asian Human Services Assoc.	Main Room—House
6)	7:30 p.m.	Denver Chamber Orchestra Concert	Mitchell Hall
7)	7:30 p.m.	Denver Chamber Orchestra Concert	Mitchell Hall
8)*	1:00 p.m.	Turfgrass Association	Classroom C
8)	7:30 p.m.	Colorado Cactus & Succulent Society	Classroom A
9)*	9:00 a.m.	D.B.G. Guild	Main Room—House
9)*	2:00 p.m.	Mile Hi United Way	Mitchell Hall
11)*	6:00 p.m.	Colorado Holistic Health Network	Mitchell Hall
12)*	9:00 a.m.	Colorado Holistic Health Network	All Rooms
14)	7:30 p.m.	Colorado Mycological Society	Mitchell Hall
15)*	1:30 p.m.	Department of Natural Resources	Classroom C
15)	7:30 p.m.	Denver Bonsai Club	Classroom B
16)	7:30 p.m.	American Rock Garden Society	Classroom C
18)	7:30 p.m.	Denver Botany Club	Classroom C
20)	1:00 p.m.	American Hemerocallis Society	Main Room—House
21)*	7:30 p.m.	The Nature Conservancy	Classroom B
23)*	6:30 p.m.	Annual Membership Dinner	Mitchell Hall
24)	9:30 a.m.	African Violet Society of Denver	Classroom B
25)*	9:00 a.m.	Ikebana International	Mitchell Hall
26)	10:00-4:00	Hi Hopes Study Club VIOLET SHOW-SALE	Mitchell Hall
26)*	8:30 a.m.	National Science Foundation	Classroom B
28)	9:30 a.m.	Ultra Violet Club	Main Room—House
<b>MARCH</b>			
1)	7:30 p.m.	Denver Bonsai Club	Classroom B
3)*	8:00 a.m.	JK Associates	Classroom A
3)	7:00 p.m.	Colorado Cactus & Succulent Society	Mitchell Hall
5)	9:30 a.m.	Gloxinia Gesneriad Growers	Classroom B

\*Members or Enrollees only

Denver Botanic Gardens, Inc.  
909 York Street  
Denver, Colorado 80206  
303-575-3751

---

Non Profit Org.  
U.S. Postage  
PAID  
Permit No. 205  
Denver, CO

---



TIME VALUE

February 1983

Address correction requested

# Green Thumb Newsletter



Number 83-3

Denver Botanic Gardens, Inc.

Editor—Tommie Waidmann

March 1983

## Around And About The Gardens

In this world of big business, big government and dahlias, we can forget that little things can matter. In the early spring it is the little bulbs: snowdrops, winter aconite, chionodoxas, anemones and crocus which give us greatest pleasure. Dutch bulb companies have rather strangely relegated these to a sort of rogue's gallery labeled 'Minor bulbs'—perhaps the writers of these catalogs have never experienced a northern spring.

In lowland climates March is often chill, dank and rainy as the winter. In such climates crocus often fail to open altogether, or they are often spattered and spoiled with mud. Here in Colorado, however, March is often characterized with warm sunny days for weeks on end. Snows can be heavy, but melt quickly and the sun blazes forth soon again. By March, everyone becomes a gardener.

And the Minor bulbs loom quite largely in the picture. Let's be charitable and pretend that the name derives from Asia Minor, for a surprising number of these bulbs do derive from Anatolia. It is no accident that they thrive here, for the climate in Colorado closely approximates that of the high, dry Turkish plateau where so many of the garden bulbs originated.



All but two species of Reticulate Iris are Turkish in origin. These have been planted thickly throughout the rock garden and have settled comfortably into the gravelly, scree-like soils. The prismatic yellow goblets of *Iris danfordiae* have a heady, musk-like fragrance. These are quickly followed in succession by the many color forms of *Iris reticulata* and the showiest of the lot, *Iris histrioides*.

Grape Hyacinths bloom later in the spring, but their sky-blue cousin *Pseudomuscari azureum* is from the Turkish mountains. These diminutive alpine hyacinths thrive almost anywhere in a Colorado garden. These can even be grown among small plants in the rock garden, for their foliage is only a few inches long, appearing



with the flowers in the late winter, and dying away promptly and tidily in the spring. The foliage of most Grape Hyacinths emerges quite early in the fall and doesn't disappear until quite late in the spring. This and their tendency to spread makes Grape Hyacinths unwelcome guests in smaller rock gardens.

Wild tulips are tremendously variable; most come from the vast steppes of Central Asia and respond to cold winters and hot summers. In some old Denver gardens, the huge Water Lily Tulip (*Tulipa kaufmanniana*) has actually naturalized in shrub borders. Almost everyone's favorite wild tulip is *Tulipa pulchella* which is found over much of the higher reaches of Eastern Anatolia. This early tulip thrives in Colorado where it can form large colonies in time. The flowers open flat on warm days, and these are of a luminous purple color in the form 'Violacea'. A small colony of these is conspicuous much of March at the apex of the meadow which forms the central portion of the Rock Alpine Garden.

The crocus are the unquestionable monarchs of March. There are few snowless days between the end of the Autumn and April when one or another species of crocus will not be found in bloom in the Rock Alpine Garden. The obese hybrid forms that crush so easily under spring snows will not be found here. Instead, several dozen smaller-flowered wild species have been naturalized in every appropriate spot around the garden. *Crocus chrysanthus* is abundant throughout Greece and western Turkey. Over the last half century the Van Tubergen firm of Holland and the great English gardener E.A. Bowles selected numerous forms of this bright spring flower. Most of these are available from local garden centers in the fall. They vary tremendously in color, but all will quickly form thick colonies that guarantee a spectacle throughout the early spring weeks.

After the doldrums of winter, the first warm, spring days are exhilarating. The same energy that makes us open up the windows and rush to do spring cleaning, the same light that fills us with spring fever makes these early, small bulbs glow with a brightness lacking in summer flowers. Come to the Rock Alpine Garden on a warm spring day and enjoy a few of these bright harbingers of warmer days.

The only thing minor about these plants is their cost and the effort necessary to have them. They cost pennies and once they are established wild bulbs will spread and naturalize in most garden settings. Note the sites and soils in which we grow these at Denver Botanic Gardens and plan to incorporate more of these in your garden this fall.

Panayoti Callas, Curator,  
Rock Alpine Garden



Merle M. Moore, Director of the Botanic Gardens, accepts a check for \$2,500 from Dave Gross (L) and Ron Brady (R), owners of City Floral Greenhouses, culminating a January-long fund raising effort on behalf of the Gardens by the firm. Botanic Gardens staff and volunteers from several plant societies presented Saturday mini-workshops throughout the month while other volunteers promoted membership in the Gardens. Pictured below is Peggy Altvater ready to sign up a new member for the Gardens. To everyone who had a part to play in this innovative benefit for the Botanic Gardens—a generous and sincere THANK YOU!



## Horticulture Therapy Chapter Forming

A workshop and organizational meeting designed to facilitate the formation of a Colorado State Chapter of the National Council for Therapy and Rehabilitation Through Horticulture (NCTRH) will be held at Denver Botanic Gardens on Monday, March 21, 1983. Convening at 1 p.m. in Classroom A of the Gardens' Education Building at 1005 York, the organizational meeting will include an introduction to the use of horticulture for therapeutic, educational, and rehabilitative purposes; presentations on the programs of NCTRH; an update on the Morrison Horticultural Demonstration Center currently under construction at the Botanic Gardens; and a discussion of the goals and program objectives of the Colorado State Chapter of NCTRH.

Mr. T. Kent Titze, Director of Horticultural Training at Father Flanagan's Boys' Home, Boys Town, Nebraska, will participate in the organizational meeting. Mr. Titze is currently Vice President of the Board of Directors of NCTRH and serves on its Long Range Planning Committee. He will also present an illustrated lecture at 7 p.m. in Mitchell Hall which will be open to the public. His subject: "Therapeutic Interactions—The Boys' Town Horticultural Training Center". Participants in the afternoon workshop and members of the Botanic Gardens will be admitted to the evening lecture free of charge. Others will be charged \$1/person at the door.

A registration fee of \$5 will be charged for the workshop and organizational meeting. This fee may be applied toward your Colorado State Chapter—NCTRH membership fee if you choose to become a member that day. Checks for payment of the registration fee should be made out to **Denver Botanic Gardens** and sent to the attention of Mr. John Brett.

Displays of books and other publications on the subject of horticultural therapy which are currently available in the Helen Fowler Library at the Botanic Gardens, as well as displays from existing Colorado horticultural therapy programs, will be available for viewing in Mitchell Hall throughout the afternoon and evening.

If you have an interest in participating in the formation of a new State Chapter of NCTRH, learning more about the Gardens' expanding program in horticultural therapy training, and finding out how this innovative approach to therapy and rehabilitation is currently being utilized in Colorado, plan now to attend the workshop. Your support and input is encouraged and needed! For more information or to register for the workshop contact John Brett at the Botanic Gardens, 909 York Street, Denver, CO 80206 (575-3751).

Mr. T. Kent Titze's evening presentation on the Boys' Town Horticultural Training Center Program (see article on "Horticulture Therapy Chapter Forming") is open to members of the Botanic Gardens and the general public. Botanic Gardens' members will be admitted to the evening program free of charge upon presentation of their membership card. Non-members not participating in the workshop will be charged \$1.00 admission fee at the door.

## Last Call For Williamsburg Tour April 16th - 24th 1983

The closing date for applications for this tour is March 15th. This is your last reminder. Brochures have been sent to all members. Should yours have failed to arrive please contact Andrew Pierce (575-3751) or Dennis Briel, Travel Associates (759-8666).

Almost half of the spaces have been reserved. You are encouraged to make your reservations now. It will be an exciting week, not only at the Williamsburg Symposium but the Historic Gardens of Richmond as well.

**THE AMATEUR NATURALIST'S HANDBOOK.**

Vinson Brown.

Prentice-Hall, Englewood Cliffs, N.J., 1980. \$7.95

QH 53 B73 1980

**NATURE WITH CHILDREN OF ALL AGES.**

Edith A. Sisson.

Prentice-Hall, Englewood Cliffs, N.J., 1982. \$10.95

QH 51 S5882

**THE CURIOUS NATURALIST.** John Mitchell.

Prentice-Hall, Englewood Cliffs, N.J., 1980. \$7.95

QH 45.5 C8752 1980

These useful additions to the amateur naturalist's shelf were made this month:

Vinson Brown's indispensable **AMATEUR NATURALIST'S HANDBOOK**, first printed in 1948, has been revised, expanded, and reissued in paperback. The volume contains all the information a beginning amateur naturalist would be likely to need, plus some material for the more advanced student. Brown gives a broad overview of all the major branches of natural history, and his detailed instructions on how and what to observe, how to keep meaningful records, and how to collect and preserve specimens are clear and concise. The author has covered an impressive range of information in such a small volume. It is delightfully easy to read as well.

**NATURE WITH CHILDREN**, an everything-you-need-to-know book for teachers or field trip leaders, describes a wide variety of nature inspired activities and gives details on all necessary materials and procedures. A chapter on out-of-doors teaching techniques completes a useful short course for the beginning naturalist instructor or, possibly, a conscientious parent.

Also designed to help the reader help children enjoy the out-of-doors, **THE CURIOUS NATURALIST** takes a more personal approach. It's intent is to invoke the wonder of nature imparted so well by "the old school of nature guides" rather than to emphasize systematized scientific facts. Material is arranged according to seasons. Drawings and descriptions are included to help one observe and enjoy the sky, the land, and all things contained therein. A calendar of natural events suggests forms of life to look for each week of the year, and how to study them. This book is a natural for parents, grandparents, and others with a particular youngster in mind.

Hazel Kellog

**NATURE PHOTOGRAPHY: A GUIDE TO BETTER OUTDOOR PICTURES.** Stan Osolinski.

Prentice-Hall, Englewood Cliffs, N.J., 1981. \$14.95

TR 721 0864

**NATURE PHOTOGRAPHY** includes both black-and-white and color photographs that will inspire any photographer, and Stan Osolinski does a fine job of involving the reader in the excitement he feels

when he is practicing his art. The author's photographic philosophy, which places more emphasis on a photographer's feeling for his subject than on unusual technical prowess, makes his work relaxed, casual, and enjoyable.

He also does a good job of photographing plants, though his six pages of text on macro photography make taking plant pictures sound unnecessarily complicated.

Plant photography is not the author's favorite subject, as it is mine. He confesses to a preference for wild animals. But I found his book a useful and entertaining guide to better outdoor pictures. Specific suggestions helped me find new ways to handle my camera and new approaches to subject matter.

Sandy Snyder

**THEME GARDENS.** Barbara Damrosch.

Workman Publishing, New York, 1982. \$10.95

SB 457.5 D351 1982

Don't be misled! This "how to plan, plant and grow" book is practical as well as beautiful and inspirational. The enterprising author has conceived and designed 16 wonderfully different theme gardens—some as familiar as the herb, Shakespeare, or fragrance gardens—some as new and provocative as "A Moon Garden" and "A Garden of Love." The illustrator and layout artist have had a field day producing this exuberantly designed book, and one reads in pleasant suspense to see what is meant by the "Moon Garden" or the "Secret Garden." The author has also provided brief historical background where this is appropriate. A thoroughly enjoyable book.

Gayle Weinstein

**THE FARM BOOK.** E. Boyd Smith.

Houghton Mifflin Co., Boston, 1982. \$12.95

j PZ 7 S6579 1982

**THE FARM BOOK** is a delightful book for children and an interesting one for adults as well. First published by Houghton Mifflin in 1910, it has now been reissued by the same publisher, who has preserved as much of the essence of the original edition as possible. It survives as an authentic bit of Americana which records faithfully (if somewhat romantically) the work, manners, styles, customs, and aspirations of the country just 10 years after the turn of the century.

Two children who live in the city go to the country for their summer vacation. They learn by experience that although farm life is hard work, it also offers many rewards.

The illustrations are delightful and the text has an easy flow. The sun is "bright," the air "sweet scented," the birds "lively and cheerful" and "everywhere... a busy bustle and promise of good crops." It is a book a "city kid" will thoroughly enjoy, in 1910 or in 1983.

Susan Praetz Fry

## **COLOUR ENCYCLOPEDIA OF SUCCULENTS.**

The Japan Succulent Society. H. Hirao, editor.  
Seibundo Shinkosha Pub. Co., Ltd. 1981. \$40.95  
SB 438 C65722

Again, the Japan Succulent Society has produced a significant work. This book is a valued companion to the Society's earlier work: *Colour Encyclopedia of Cacti*. Although written in Japanese, both are valuable references for succulent plant lovers because of the quality of the magnificent color photographs and the reliable nomenclature used in identification of the species presented.

From *Aloe* to *Xerosicyos* there is excellent coverage of most of the important succulent genera. Especially well represented are the genera *Aloe*, *Haworthia*, *Echeveria*, *Sedum*, *Euphorbia* and *Pachypodium*. Somewhat limited treatment is given to the genera *Aeonium*, *Kalanchoe* and *Senecio* but this may merely reflect the variety of succulent types in cultivation in that area.

With this book the Japan Succulent Society has made another important contribution to the cataloging of world succulents through the medium of color photography.

## **THE GREAT PUBLIC GARDENS OF THE EASTERN UNITED STATES.** Doris M. Stone.

Pantheon Books, New York, 1982. \$12.95  
SB 466 U6 S8653

Gardeners planning a trip East this spring may safely forego Frommer, Fodor and company; this is the book you'll want to fit into your luggage. Those *not* planning such a trip will find it good consolation. Packed with information organized for instant access, this book is a comprehensive survey of 34 great eastern public gardens—Winterthur, Dumbarton Oaks, Williamsburg, Arnold Arboretum and all the rest.

It is not a glamorous book. Layout and organization are planned for efficiency; they allow the author to present as much information as possible without fouling communication lines. Facts are pre-sorted. Photographs are valuable as record shots, not as art. But in slightly less than 300 pages the author manages to instruct us on unique features, history, design, botanical significance, as well as miscellaneous travel information concerning these gardens. She also presents timely "asides" on such subjects as the Renaissance garden, Andre Le Notre, Capability Brown, etc., and like a docent enamoured of her subject matter, tosses in a few choice anecdotes for good measure.

**Jean Williams**

## **NATURE DRAWING: A TOOL FOR LEARNING.**

Clare Walker Leslie.  
Prentice-Hall, Englewood Cliffs, N.J. 1980. \$9.95.  
NC 780 L4748

Essentially directed to the beginning illustrator, this guide contains a wealth of tried and tested techniques which can be used by advanced students and professionals as well. The central principle, which Ms. Leslie stresses throughout, is the necessity to train the eyes to "see" nature keenly. For this she recommends basic short exercises: memory drawings, gestural sketches, and especially contour exercises.

There are occasional lapses of credibility (for me) such as the amazingly complete 5-seconds gestural sketch of a cat with kittens by the author, but on the whole, **NATURE DRAWING** is a comprehensive, well-researched effort. Ms. Leslie is sometimes repetitious but

often extremely exciting. As an illustrator myself, I found Chapter Eight on "Keeping a Field Sketchbook" to be so exciting I have started one myself. There was also a gasp of "Oh, I need that," referring to the camera lucida microscope used for technical dissection drawings.

**Carolyn L. Crawford**

## **GARDEN DESIGN.** David Hicks.

Rutledge and Kegan Paul, Ltd., London, 1982.  
SB 473 H534

Spend a few hours with David Hicks, internationally known landscape (and interior) designer. He has buried gems of design knowledge in a rambling text, and given us a unique, personal view of public and private gardens in Great Britain and France, including his own.

His landscape style is a direct continuation of the great formal 17th and 18th Century gardens of the European aristocracy—those large carefully designed and expensively maintained gardens featuring geometric parterres, formal clipped or pleached allees, box and yew hedges, walls and terraces of stone. His ideal returns to the formal, the linear, the classical, ignoring the more recent romantic, natural-landscape styles featuring freeform designs, long sweeping curves, and random asymmetric plantings.

You might think that only the owner of a large mansion on fifty wooded acres can use his ideas. Not so. Hicks makes a good case for the use of strong, decisive linear design in a small space. "Small gardens, need a sense of design even more than medium or large gardens, since the range of possible effects is more limited," he says. His useful technique of blackline drawings on actual garden photographs gives graphic evidence that his ideas can be adapted for general use. Our challenge, as always, is to adapt and translate the design elements to our particular High Plains situation.

Because of our commitment to function and use, modern American gardens rarely approach the vividness and emotional power of the gardens Hicks describes here. But we can dream, can't we? And perhaps create as well...

**Jan Caniglia**

## **FROM THE LIBRARIAN'S DESK:**

Susan Coombe and Kathy Fletcher, DBG ANNUAL BOOK SALE chairmen, report that work has started and enthusiasm is great. They expect a large collection of gardening, natural history, and sports-related books. Your donations of books of all kinds are welcome. Bring them to the DBG Library or phone 575-3751, ext. 33 for help. BOOK SALES DATES: May 6 and 7.

**Solange G. Gignac**

## **THE REVIEWERS**

**Hazel Kellog**—DBG volunteer, Member of Denver Field Ornithologists

**Sandy Snyder**—Rock gardener, Denver Botanic Gardens.

**Gayle Weinstein**—Botanist-Horticulturist, Denver Botanic Gardens.

**Carolyn L. Crawford**—Botanical illustrator.

**Susan Praetz Fry**—Gardener II, Denver Botanic Gardens.

**Olin Webb**—Member, Colorado Cactus and Succulent Society.

**Jan Caniglia**—Landscape architect, ASLA.

**Jean Williams**—DBG volunteer, free lance writer.



## Gardening Tips For March 1983

Usually I direct my comments in this column to specify gardening suggestions, emphasizing particular chores that are appropriate to the season and weather conditions. Considering the blizzard at Christmas in the Denver area, perhaps the less said about our weather, the better. On the other hand, with the great influx of new Colorado residents, and the considerable number of new readers to the GREEN THUMB, it would seem appropriate to discuss some of the vagaries of gardening in Colorado that "natives" sometimes take for granted.

### Gardening in Colorado a Challenge

Gardening in Colorado can be a challenge as well as a unique experience. The average elevation of the state is 6,800 feet above sea level with three-fourths of the nation's land above 10,000 feet located within its borders. Much of the populated areas of Colorado are on heavy, clay soil with poor aeration which inhibits root growth. Thus, the ability of plants to replenish water loss due to low humidity and prevailing winds is limited. The dilemma is that adding more water to such soil only further complicates the problem, because the additional water will reduce the amount of air in the soil and causes what is known as "oxygen starvation" to the roots. Little can be done to modify humidity and wind, so the obvious solution is to improve the soil.

This is not easy and cannot be done all at once. Organic matter when added in large amounts all at once can provide for a more porous soil, but this can lead to an accumulation of natural, soluble salts. Unless the soil is porous so that salts can be leached away with water, the salts tend to accumulate in the amended soil layer. The solution to this problem is to slowly, over a period of years, improve the soil tilth. This is a continual process, often taking ten years or more.

An alternative to leaching the salts and improving the soil is to select plants more tolerant of existing soil conditions. Many newcomers previously gardened where "you stick a plant in the ground and it grows". Since this rarely happens, the wise gardener, instead of planting a pine that would do poorly, may have to settle for a juniper or Russian-olive.

In Colorado, sunlight is of frequent high intensity and the humidity generally is low. These unique features, along with rapid and extreme weather changes create challenges in growing plants. Here again, it is wise to select plants that can cope with these conditions rather than attempt to modify the environment.

The name "Colorado" comes from the Spanish words "Color Rojo" meaning color red, referring to the dominant red soils. The red color is due to high amounts of iron in the soil. Yet, a yellowish condition in certain plants, known as iron chlorosis, is brought about by an iron deficiency, because Colorado's high calcium soils "tie up" the iron in a form unavailable to the plant. Trees with high iron requirements such as pin oak, silver maple and Washington hawthorn perform poorly in our calcareous soils.

Making iron more available is not easy nor is it economical. Adding available forms of iron (iron sulfate) to the soil is, at best, a temporary measure since the soil itself will quickly cause much of the added iron to become unavailable. Thus, again, the alternative is one of selecting plants tolerant to the alkaline soil conditions in Colorado.

On the Eastern Slope of the Rocky Mountain, early, heavy, wet snows occur about once every five to eight years. Trees, shrubs and garden flowers are caught in full leaf or just at the peak of bloom. These "limb-breakers" cause severe, natural pruning that leave permanent scars and tend to keep trees to smaller-than-normal size. Following a "limb-breaker", tree diseases tend to increase and take their toll. The wise gardener will choose less brittle trees such as linden, oak, ash and honey locust instead of silver maple (soft), Siberian elm (Chinese), and willow. This, however, brings about another dilemma. The less-brittle trees also are the slower-growing ones. Patience must be the byword.

Newcomers from coastal states such as California, Oregon, New York and the Carolinas frequently express surprise and disappointment in the near lack of broad-leafed evergreen plants such as mountain laurel, rhododendron, pittosporum and similar plants. Mountain laurel, rhododendron and similar types of plants can and are grown in Colorado where the soils are carefully amended to make them more acid and where the plants are protected from winter, wind and sun. Even those broad-leafed evergreens that can tolerate the more alkaline soils and lower humidity will perform best in a shaded, north or east exposure. Examples of these are the wintercreeper, English ivy and Oregon grapeholly.

Occasionally, Colorado will experience frosts and freezes at a time when plants aren't ready to cope with them. It is not uncommon for mountain communities to have an already-short growing season interrupted by a killing frost. The real killers, however, are the infrequent but rapid changes from warm, balmy weather to very cold, sub-zero readings. On October 19, 1969, for instance, Denver experienced a temperature drop to minus three degrees F. This was preceded by balmy, eighty-five degree weather. A similar temperature change occurred in September, 1971. Such freeze injury leaves crippling marks on trees for years and serves to eliminate many plants with "borderline" hardiness. Most severely injured in such freezes are the rapid, lush-growing trees. Thus, the wise gardener again must be patient, and select the slower-growing, but more reliable plants.

Up to this point, the newcomer may wonder what's the use, but there is a brighter side.

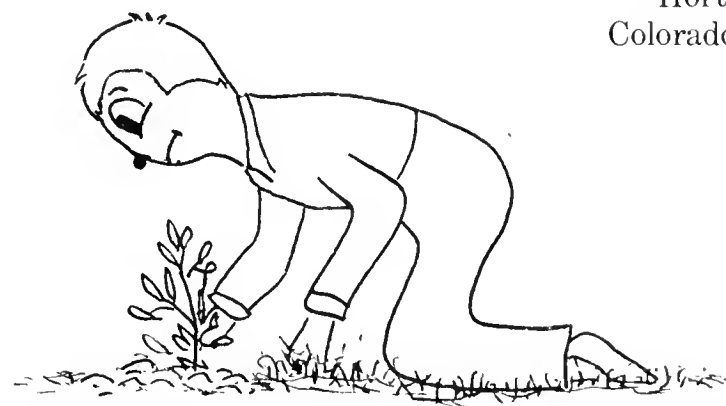
Colorado's many days of sunshine enables the gardener to grow some of the best flowers in the nation. The high light intensity produces strong-stemmed plants and flowers with extra brilliance. Vegetables, with some care in selection of variety, grow luxuriantly in most locations. The same sunlight in winter melts snows at lower elevations quickly, reducing snow and mold diseases in lawns. Growers of roses, carnations and other greenhouse crops produce some of the best quality cut flowers in the world. The home gardener with irrigation facilities produces the best lawns in the nation, as well as excellent potatoes, cabbage, lettuce, broccoli, cauliflower and other "cool-season" vegetables.

Our lower humidity not only helps to make the cold days seem less cold, and hot days less hot, but also discourages many landscape plant diseases which are common in more humid areas.

Perhaps the brightest side lies in the very unique and challenging problems in growing plants. Gardeners who are patient, know how to select plants and manipulate the soil and microclimate will be amply rewarded.

Help in gardening is as close as the telephone. The Colorado State University Cooperative Extension Service has county offices prepared to help with individual gardening needs. Leaflets are available and provide detailed information on the selection and care of trees, shrubs, garden flowers, vegetables, and lawns, both for the plains area and high mountain communities. To contact your county office, consult the white pages of your telephone directory under either state or county listings.

Dr. James R. Feucht  
Horticulture Professor  
Colorado State University



## Partridge Feather

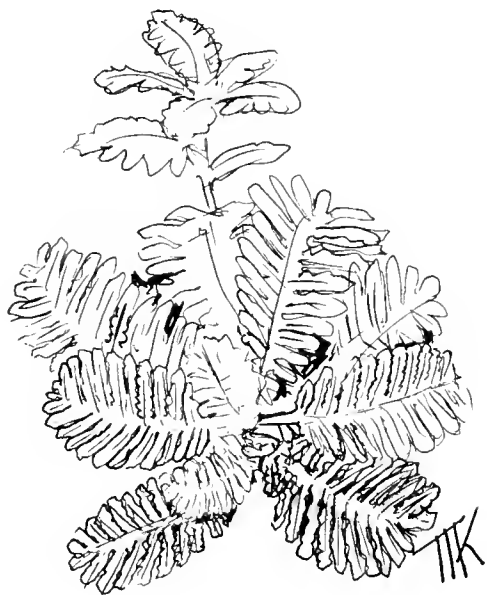
The origin of many garden plants is a mystery. Everyone is familiar with Tall Bearded Iris, roses, chrysanthemums and lilacs, but we cannot pinpoint which plants are their progenitors. We may suspect this or that wild species led to the Hybrid tea rose, for instance, but there is no way to prove our supposition at present. After all, for a plant to become adaptable to myriad gardens in many countries, one expects it to undergo great metamorphoses.

It is somehow gratifying to discover a wildling that has entered gardens untampered by hybridizers, unchanged by cultivation. When the entire history of its introduction can be traced, our pleasure in growing the plant is even enhanced. Such has been the case with the Partridge Feather. This intriguing groundcover has been featured in several sites around Denver Botanic Gardens as well as in discriminating gardens throughout the region. Several nurseries have begun to offer this plant locally, and it is available from a number of mail-order nurseries. The greatest obstacle to obtaining this plant is the multiplicity of Latin epithets of its horticultural history that have been inflicted upon it over the last three decades.

In wet climates, the older leaves turn a distressing shade of black. In Colorado, however, the slowly spreading mat of feathery rosettes with an almost succulent texture and eerie whiteness, stay relatively fresh and clean throughout the winter months. By March most evergreen groundcovers in Colorado begin to show considerable wear and tear. But not the Partridge Feather. This is not entirely unexpected. It grows naturally in the Amanus Mountain region of Southwestern Anatolia, a region with a dry, continental climate almost identical to that of the Colorado Front Range.

All plants of Partridge Feather in cultivation derive from a collection by Peter Davis known as *Achillea* sp. PD 16366. Indeed, the foliage does remotely resemble an achillea, as do the corymbs of buttonlike yellow flowers. Partridge Feather was sold under this designation in Great Britain for many years.

Details of flower structure and the twice pinnatifid foliage of this plant ally it with tansies and chrysanthemums: the Turkish Partridge Feather was assumed to be identical with a Russian plant described as *Chrysanthemum haradjani* from Soviet Armenia. Hundreds of miles to the Northeast. It was under this name that the Partridge Feather entered cultivation in the United States, and this name is still used by most American nurseries and botanic gardens which grow it.



Much systematic study has been done on Anatolian plants from the time Peter Davis collected seed of Partridge Feather in 1950. Five volumes of the *Flora of Turkey* have been published by Edinburgh Botanic Gardens. In these, Peter Davis has delineated not merely this subspecies, but four other forms of this species that are disbursed rather widely in the Near East. Numerous botanists have collected this plant and related forms over the last century and a half, but these collections have only been systematized in the last two decades when the *Flora of Turkey* was compiled.

Let's not assume that the last word has been spoken on *Tanacetum densum* subsp. *amani*. There are strict rules governing the application of new specific epithets and even subspecies or varietal designations. Any botanist with a notion can apply generic concepts practically at will.

Fortunately, someone coined the name, Partridge Feather, for this Turkish mountain waif. No matter what vicissitudes its Latin name may undergo, it will rest peacefully in the safe harbor of an appropriate and simple common name.

Panayoti Callas  
Curator Rock Alpine Garden

## Classes Scheduled For Outdoor Guides

Have you always wanted to learn more about the outdoor gardens and use your knowledge as a volunteer guide? Here's your chance.

Classes are scheduled to begin on Tuesday, April 5 through May 17 from 9:30 a.m. to 11:30 a.m. in classroom C. Fee: \$15.

You will learn the history and development of the gardens in general, along with specific gardens and their components. Outdoor guides who have had this training are welcome to return for a brush up. Further information available at 575-3751.

## Tributes

**In memory of Irma Dahlquist**  
Florence A. Vatter

Alan Rollinger  
Guenther Vogt (GEV)  
Larry Watson

**In memory of Marie V. Guy**  
Miss Geraldine Boller  
Mrs. Myrtle Boller  
Denver Rose Society  
Miss Carolyn Fyelling  
Beverly Nilsen

**In memory of Mrs. Alonzo Lilly**  
Mr. and Mrs. John Falkenberg  
**In memory of John M. Maxwell**  
Morning Belles Garden Club

**In memory of Roy Krell**  
Richard Bankhead  
Denton, Harper and Marshall  
Randy and Terril Fitzgerald  
Bill and Cynthia Kostka  
Lifescape, Ltd.  
Chris Moritz  
Jane Silverstein Ries

**In memory of Mary Howard Parr**  
Dr. and Mrs. John S. Avery  
**In memory of Mrs. I.W. (Betts) Strong**  
Mr. and Mrs. Lawrence A. Long  
**In memory of Margaret Crowley Talbott**  
Mr. and Mrs. John Falkenberg  
Dr. and Mrs. William C. Jackson, Jr.

Contributions of cash, goods, or services have been received from the following friends:

Am. Iris Society Convention—Denver 1982  
Scott Boggess  
Colorado Forestry Association  
Denver Bonsai Club  
Merel O. Woods

## Botany Club Meeting

Tuesday, March 18 at 7:30 in classroom C. Dr. Richard Schwendinger and Mr. Albert Daraghy, both transplants from the East, will present a slide presentation of the various nature preserves in the New York City area, especially the Hudson River Palisades.

---

## Volunteer Aides for Outside Gardens

---

Wish to turn your purple thumbs green or make our outside gardens even greener? Then "Meet the Gardeners" program is for you. Thursday, March 24 at 2 p.m. is the time for volunteers to assemble for an introductory meeting at Botanic Gardens House, 909 York Street.

Severe budget restraints have forced the Gardens to seek volunteers to assist our very limited gardening staff for a few hours on any week day between 7:30 a.m. and 5 p.m. throughout the coming season. This gardening program is an opportunity to gain horticultural knowledge through special training sessions, to enjoy fresh air and exercise with others who believe gardening is fun and who have time to share in keeping Denver Botanic Gardens beautiful.

Last year 25 participants, high school students through retirees, found working with roses, rock-alpine plants, in the Japanese garden or areas where their efforts were needed was personally rewarding. In fact, one youngster, who plans to return this year, gave more than 200 hours and hopes for a career in horticulture.

Tom Walters, chairman of this volunteer program, plans educational workshops as well as potlucks and picnics to foster a friendly gardening experience.

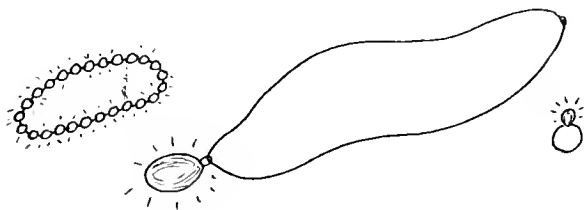
Come, meet the gardeners on March 24 and register to polish the Gardens' landscape. After a brief introduction to the Gardens with Merle Moore, our director, interested volunteers will tour the garden areas and return to the House for refreshments, registration for classes and to set up work schedules. Volunteers in this program must be members of Associates, an organization whose members manage and staff the gift shop, carry out the guides programs and assist in other ways. Dues are \$1 per year. If you are unable to attend but want to green your thumbs and the Gardens, phone Tom Walters at 526-0154.

BEP

---

## Amber Jewelry A Natural For Gardens Gift Shop

---



Lustrous amber with biological inclusions is doubly appropriate when fashioned into jewelry selected for sale at Denver Botanic Gardens Gift Shop. Shaped, polished and crafted into pendants, necklaces, bracelets, rings and other articles many amber pieces have been simply but elegantly mounted in silver by Scandinavian craftsmen.

Scientists believe this semi-precious stone is fossilized resin from pines that grew some 50 million years ago. Tiny flowers, insects, leaves, bits of bark were captured in the golden or reddish-brown amber featured at the shop.

Highly prized for thousands of years amber has been used for mugs, bowls, amulets, snuff boxes, candlesticks, beads and sculptures. Some museum treasures date to the Stone Age through Roman and Medieval periods, others are Victorian to modern art forms. Although prevalent in many areas throughout the world, the greatest finds of amber are near the North and Baltic Seas with recent discoveries in Lithuania and the Dominican Republic.

Visit our gift shop to enjoy this annual collection of amber jewelry—miniature showcase of Earth's earliest flora. Sometimes mere bubbles or spider webs, preserved for eternity, produce intriguing optical effects. Besides its warmth to touch, this semi-precious gem is surprisingly light in weight.

BEP

---

## Poison Awareness Campaign

---

Presidential proclamation has designated the week of March 20-26 to be **National Poison Prevention Week**. The Gardens join Governor Richard Lamm and the Poison Control Center in Denver in setting up an information center and series of displays related to accidental poisoning.

The Helen Fowler Library will have special book and bulletin displays on the subject of poisonous plants. The Kathryn Kalmbach Herbarium will display pressed specimens of plants to increase people's recognition and awareness of those species known to have poisonous properties.

Living plant specimens from our greenhouses will further illustrate both commonly used house plants (*Dieffenbachia* or Dumb Cane, for example) that are potentially dangerous as well as less well known species. In the Lobby of Boettcher Memorial Center, display cases containing poisonous species of mushrooms and toadstools will exhibit some of these too-frequently mistaken and eaten fungi.

While recognition and identification of poisonous plants is an important objective of the Gardens' participation in National Poison Prevention Week, an equally important purpose is to make our members and the general public more aware of the Rocky Mountain Poison Center and its programs. The Center deals with all aspects of accidental poisoning, of which plant related poisonings are only one part. They serve a vital function in our community and a greater awareness of the services the Center provides could someday save the life of someone you know.

We encourage the entire family to visit the Gardens during National Poison Prevention Week. You may be surprised to learn how close at hand some of the potential hazards in our everyday world are. Preventing accidental poisoning should be a concern for all of us.

*Correction:* An error was made in the article "Knot Gardens" by Susan Praetz Fry in the "Jolly Green Gardener" Vol. 13, No. 1, Feb. 1983; (Green Thumb Newsletter, Feb. 1983, No. 83-2). The Herb Garden's center statue "The Boy and a Frog" was given to the Denver Botanic Gardens by Louisa Ward Arps in memory of her aunt, the late Elsie Ward Hering, the sculptress.

---

## Announcements

---

Solar Greenhouse workshop, Sunday, March 6, 9:00 to 4:30 at Mitchell Hall. Fee \$16.50/person

*A Reminder:* Elizabeth Scholtz's Lecture on Friday evening, March 18th from 7:00 to 9 p.m. in Mitchell Hall.

Members of the Denver Botanic Gardens, students and senior citizens will be admitted for \$1.00/person. Non-members other than students or seniors will be charged \$2.00/person at the door the evening of the lecture.

Return Engagement—Plant Sale. Sure to be a sellout. May 6 and 7. Needed now: volunteer cashiers, adding machines to be loaned or donated, books, gardening and gourmet magazines for used book booth. Please call Mrs. Fletcher 455-0467 or Mrs. Toll 333-1655. Chairman: Mrs. Willett Moore.

# UPCOMING EVENTS for MARCH

1)*	9 a.m.-1 p.m.	Denver Zoo-Docent Program	Mitchell Hall
1)	7:30 p.m.	Rocky Mt. Bonsai Society	Classroom B
2)	7:30 p.m.	Gilded Garter Gesneriad Growers	Classroom B
3*)	11:30-4:00	Guides Tea	Main Room-House
3)	7:00 p.m.	Colorado Cactus & Succulent Society	Mitchell Hall
4)*	11:00 a.m.	Civic Garden Club	Main Room-House
5)	9:30 a.m.	Gloxinia Gesneriad Growers	Classroom A
6)*		Solar Greenhouse Workshop	Mitchell Hall, A, B
7)	7:30 p.m.	Colorado Mycological Society	Mitchell Hall
8)	7:30 p.m.	Colorado Cactus & Succulent Society	Classroom B
9)*	10:00-1:30	D.B.G. Guild Luncheon	Main Room-House
10)	7:30 p.m.	Denver Rose Society	Main Room-House
10)	7:45 p.m.	Denver Orchid Society	Mitchell Hall
11)	7:30 p.m.	Denver Dahlia Society	Main Room-House
12)	All Day	Rose Symposium	Mitchell Hall
13)	7:30 p.m.	Denver Chamber Orchestra Concert	Mitchell Hall
14)	7:30 p.m.	Denver Chamber Orchestra Concert	Mitchell Hall
15)	7:30 p.m.	Rocky Mt. Bonsai Society	Classroom B
16)	7:30 p.m.	American Rock Garden Society	Classroom C
17)	All Day	FREE DAY for Denver City & Co. residents	
17)	7:30 p.m.	Indoor Light Gardening Society	Classroom B
18)	7:00 p.m.	Lecture: "Plants and Man" - Elizabeth Scholtz, Brooklyn Botanic Garden	Mitchell Hall
19-	1:00 p.m.		
20)	daily	Brinkmann Florists-Holland Floral Demonstration	Mitchell Hall
19)	9:30 a.m.	Hi Country Judges' Workshop	Classroom A
19)*	12:30 p.m.	Rocky Mt. African Violet Council	Main Room-House
20)	1:00-5:00	American Hemerocallis Society	Classroom B
21)*	10:00 a.m.	Colorado Federation of Garden Clubs	Classroom A
21)*	1:00 p.m.	NCTRH Organizational Meeting	Classroom B
21)*	7:00 p.m.	NCTRH	Mitchell Hall
21)*	7:30 p.m.	The Nature Conservancy	Classroom B
23)	12:00 noon	Colorado Garden Show, Inc.	Main Room-House
24)*	10:00 a.m.	Around the Seasons	Main Room-House
24)	7:30 p.m.	Men's Garden Club of Denver	Main Room-House
25)*	9:00 a.m.	Ikebana International	Main Room-House
26)	9:00-4:00	Rky. Mt. African Violet SHOW & SALE	Mitchell Hall
27)	9:00-4:00	Rky. Mt. African Violet SHOW & SALE	Mitchell Hall
28)	9:30 a.m.	Ultra Violet Club	Main Room-House

\*Club members only

## Denver Botanic Gardens, Inc.

909 York Street  
Denver, Colorado 80206  
303-575-3751

Non Profit Org.  
U.S. Postage  
PAID  
Permit No. 205  
Denver, CO

TIME VALUE



March 1983

Address correction requested